The Builder.

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Lambeth Municipal Buildings Competition.....Design by Messrs. Ashley & Winton Newman.
Organ Case, St. Paul's School.....Mr. T. R. Spence, Architect.

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The late Mr. Waterhouse.

THE lamented death of Mr. Alfred Waterhouse removes from among us one of the most eminent and notable personalities connected with modern English architecture. In regard to the extent and variety of the work which he carried out, and the universality of his reputation, his professional career has no recent parallel except that of Scott. People who, either as foreigners, or as members of other professions, hardly knew the name of any other English architect, were all familiar with that of Waterhouse. Such a position and fame does not of course necessarily imply, any more than in the case of Scott, that he had produced the best architecture of his day. But it does imply very remarkable qualities in regard to power and grasp over the problems of modern architecture, and readiness and facility in working them out. In this respect he was unrivalled. With a quickness of perception in regard to planning, which long practice had developed almost into an intuition, he was able to carry out buildings on a large scale almost as an improvisation, seeing at a glance the key to the whole treatment of the scheme, and clothing it at once in an architectural garb.

The building which first made Mr. Waterhouse famous, the Manchester Law Courts, was in this sense eminently characteristic of him. In style it is a revived Gothic, which was all in fashion then, which is not in fashion now; and by those who, whether consciously or not, are influenced in their taste by fashion, it is probably regarded with little sympathy now, just as Scott's churches are regarded with little interest by the same class of critics. But architectural works ought fairly to be judged from the standpoint of the period in which they were designed; and for that period the Manchester Law Courts was a very fine Gothic revival building. But in regard to plan its value is permanent. The admirable arrangement by which the public are admitted in the most direct way to the public portions of the courts, while separated entirely from the official portion of the building, was a masterstroke in planning, the imitation of which in the National Law Courts forms the only good piece of planning in that inconvenient building; and it has received the similar compliment of imitation in a good many other cases. The Manchester Townhall, which we are inclined to think will always remain the building most characteristic of him, is also a remarkable example of ingenuity of planning, which however can only be fully appreciated by those who knew the requirements made in the instructions to competing architects. The size and the relative positions of the various rooms were laid down with a minuteness and particularity which, considering also the peculiar nature of the site (an irregular triangle), rendered the compliance with the programme somewhat of the nature of a Chinese puzzle; but in Mr. Waterhouse's plan all the rooms seemed to have arranged themselves just as required, without even any appearance of difficulty or complexity. The building as a whole represents, at its best, the style of modernised and municipalised Gothic which Mr. Waterhouse to a great extent invented or developed for himself; and there is a unity of conception about the whole, taking plan and architectural treatment together, which certainly renders it one of the most successful and typical secular buildings of the English Gothic revival.

While we have compared Mr. Waterhouse with Scott in regard to his immense practice and extended reputation, and while he, like Scott, commenced as a mediæval revivalist, it must be added that he was a far more original architect than Scott. Even when practising as a mediævalist, almost at the commencement of his career he developed in his secular buildings a treatment of Gothic largely his own—the Gothic with square-headed windows and angle shafts, which was imitated so largely that he may be said to have started a Waterhousian manner in this country, as definitely as Richardson started a Richardsonian manner in the United States. The cult of this manner has passed away, but it passed away with its originator also. The City and Guilds Institute and the Natural History Museum show little reminiscence of this earlier manner; they differ both from it and from each other.

Indeed, it is very unusual to find two large buildings by the same architect, so near each other as the two just mentioned, and so distinct in manner and treatment. The Institute building, though somewhat heavy in style, is exceedingly dignified and very suitable in treatment and expression to its purpose. It has the appearance of a building erected for serious study. The Natural History Museum, on the contrary, is in an exceedingly florid style; it is a typical example of the elaborate detail suitable only to terra-cotta, a material which Mr. Waterhouse was largely instrumental in bringing into fashion, and of which, no doubt, we have had rather too much. The idea of the architect seems to have been to render the exterior of the building symbolical of the multiplicity of form and detail in nature. For a monumental building, this treatment has been carried too far; the building wants repose and has too much the appearance of a *tour de force* in terra-cotta detail; and it must be admitted, too, that the outline of the end pavilions is not very graceful. But when we consider what a number of modern buildings have been erected in which both the general forms and the detail are almost entirely imitative, one cannot but be struck with the remarkable originality of design of the Natural History Museum. It resembles no other building in the world, ancient or modern; its defects may be its own, but so also are its merits. And here again the plan is a very fine one; simple and comprehensive in conception, and eminently suited to its purpose as a museum. In some minor practical points it would have been still more suitable, had not a false economy on the part of the Government tied the hands of the architect and prevented him from carrying out his ideas in their entirety. For he had considered its practical uses as a museum very carefully, and his own approved plan included a special feature in the shape of students' corridors at the back of the bays of the great hall, which were to be open only to students and scientific experts under special orders, and from which the cases could be opened and the subjects handled and examined with a freedom which could not be permitted to the general public. This was an eminently practical idea, new at the time, and for the conception of which the architect ought to have credit, though he was prevented from carrying it out. The most regrettable point in the interior is the employment of iron principals in the roof of the great hall, thus destroying its monumental effect. We have never been able to understand why this was done, since a barrel-vault in terra-cotta could have been carried out which would have left the whole constructional and architectural effect uniform. But with whatever defects, the Natural History Museum is a very remarkable and a very original building, and one which has not failed to secure the admiration and appreciation of foreign architects.

The leading defect of Mr. Waterhouse's architecture is perhaps, however, too much exemplified in this work, as it is also in his various buildings for the Prudential Assurance Company, which are prominent features in the street architecture of a good many of our cities. That defect consisted in a lack of simplicity and reserve in outline and detail. Occasionally, indeed, he surprised us by a remarkable breadth and simplicity of treatment in one building or one portion of a building, as in the case of the end façades of his great railway hotel at Liverpool, which are admirable and at the same time most original. But as a general rule he seems to have been dissatisfied unless he had covered a building with detail and had broken up the outline and the surfaces by clever and unexpected manœuvres, as one may call them, in the treatment of wall-planes and skyline. It is characteristic of his architectural taste that he seems rather to have loved odd and irregular angle sites for buildings, and pleased himself in contriving how he could lead up to and make the most of the salient angle of the plan. One of the best examples of this is the National Liberal Club, with its tower at the extreme angle; a building in other respects showing more breadth and repose of treatment than a good many others of his works. The general tendency of architectural feeling of late years has been increasingly in favour of simplicity of treatment and suppression of ornamental detail; a fashion which, in its turn, has in some instances been carried too far, almost to the extinction of architectural character except such as is derived from sound and solid construction. Mr. Waterhouse, after he had once quitted the field of mere Gothic revival, took no account of such movements in architectural taste, but went his own independent way. In consequence of this, he has almost been made a by-word among the younger generation of architects, and one may hear righteous horror of his works expressed in violent language, by young men who probably do not possess the knowledge or the practical capacity to have carried out at all one of Mr. Waterhouse's greater and more important buildings. This cant has been taken up by non-professional men in certain sets; men who probably know nothing whatever about architecture on its practical side, and little enough of its artistic side, but who seem to be convinced that it is good æsthetic form to dislike Waterhouse, and express themselves accordingly. We cannot deny that we agree to some extent with the feeling as to Mr. Waterhouse's architecture being deficient in refinement and simplicity of detail; but the current criticism against it has been pushed to an absurd exaggeration by people who seem quite blind to his real powers as an architect, and many of whom merely speak by rote, and could probably give no good reason for their prejudice. We should have preferred that the new London University Hospital in Gower-street should have been carried out in a style more in accordance with the University buildings opposite, with which the old hospital, plain and uninteresting in itself, was obviously intended to group. The present new building is too restless in detail, and might with advantage, considering its surroundings, have been treated in a broader and simpler style. But how many of the architects of the super-æsthetic school who scoff at it could have seen so well how to plan a hospital so as to get the most accommodation and the most light and air within the very limited site available?

For a list of the principal works carried out by Mr. Waterhouse we must refer the reader to the formal obituary notice which will be found under the usual heading. We can only here mention some few other characteristics of the deceased architect. Mr. Waterhouse was an accomplished artist both in oil and watercolour, not only in the way of architectural illustration—the views of his own buildings were always coloured by himself—but also in landscape, and had a large collection of sketches and studies of his own from nature. At one of the Royal Academy Exhibitions in recent years his single contribution was, not an architectural design, but a very pretty landscape in oil, entitled "Outside my Gate," in which he had given a most faithful picture of the view down the road outside the gate of his country house at Yattendon; a picture immediately recognisable by any of the friends who had the good fortune to know the hospitable house and its surroundings. The part which Mr. Waterhouse played as an assessor in architectural competitions, of late years, was a very important one, and it may be truly said that as an assessor he was almost if not quite unequalled. The same rapid grasp of the whole problem which was shown in his own plans was shown also in his quick and sweeping insight into the qualities of a large set of competition designs, and the almost unerring manner in which he would recognise and select the one which showed the best all-round merits in relation to the site and the objects of the proposed building. He also took a most enlightened and enthusiastic interest in the proceedings of the "Society for Checking the Abuses of Public Advertising" of which he was the President and to a great extent the founder, and to which he ungrudgingly gave a great deal of time out of his busy days.

Whatever differences of feeling existed about the architect, there was no difference, among those who had the pleasure of knowing him, in regard to the man. We think it might pretty safely be said of Mr. Waterhouse that among those who knew him personally he had none but friends. His simple and unaffected kindliness and sincerity of manner won upon every one. He was a good, upright, and amiable man; and taking his works all round, he was unquestionably a great architect, and one of whom his country may well be proud.

ISOLATION HOSPITAL, PRESTON.—The corner stone has just been laid of the administrative block of an Infectious Diseases Hospital for Preston. The site is at Holme Slack, off Deepdale-road. There are to be two pavilions for scarlet fever patients, one for diphtheria, and one for typhoid, the number of beds provided being fifty-six, or about one for every 2,000 inhabitants. The administrative block contains on the ground floor matron's sitting and bed-rooms, nurses' sitting and dining-rooms, doctors' room and dispensary, waiting-room, store-room, kitchen, servants' hall, pantry, scullery, ice store, etc., together with discharge block. In the nurses' duty-room the windows open into each ward. The plans have been prepared by the Borough Surveyor and his staff. The cost will not exceed 20,000*l*. The contractors are Messrs. T. & R. Colley, of Preston.

LANGFORD MANOR, SOMERSET.

LOOKING across the Vale of Sedgemoor from the high road on a midwinter's day one sees the waters stretching away as far as the eye can reach, bounded at the horizon by a low ridge of hills; here and there the crown of a hedge testifies to the fact that the waste of waters has only temporarily submerged the low-lying lands.

It is probable that Sedgemoor was a backwater of the Bristol Channel at a comparatively recent date, and that waves once lapped the bases of the hills where now stand Aller and Glastonbury. The moors and lowlands still pay a yearly tribute for their brief season of jewel-like summer splendour. The high road between Curry Rivel and Taunton, winding along the crown of an undulating ridge of hills, has strongly-marked characteristics of its own. Passing the village of Curry Rivel, the deeply-wooded park lands of Burton Pynsent stretch away on the North side to the foot of the hills fringing the Southern edge of Sedgemoor. Pitt's mansion, now quite neglected, is almost hidden by the dense mass of surrounding foliage of beeches and elms, and giant cedar-trees, which clothe the spurs of the hills with a mantle of darkest green. At intervals deep ravines encroach almost to the edge of the highway, opening up extensive views across the valley; to the south a vast panorama of vale country unfolds itself, girt about towards the horizon with undulating hills. The valley is intersected by the river Isle, a tributary of the Parret.

To the east lies the interesting village of Muchelney. A part of its originally fine Abbey still remains. Until recently Muchelney was a village of old houses, but unfortunately the builder has now found a foothold, and the characteristic village green, with its cross and XIVth century vicarage, has been entirely spoilt by the erection of a glaring villa, which dwarfs the proportions of the adjacent buildings. The new work replaces a thatched cottage of considerable archæological interest; it formerly contained an external niche, in which a sculptured figure stood. The group was situated above the entrance doorway of the house. The builder, to emphasise the beauty of his own handiwork, has enshrined the sculptured figure in the centre of his new façade. Away to the south-east the conical hills of Montacute are outlined against the sky, sheltering the famous house of the same name. A few miles away to the South, on a clear day, Barrington village can almost be seen, its celebrated Elizabethan house now falling into decay; but still unsurpassed in the richness of its detail, its grey walls and lichen-covered roof making a foil to the fretted lace-like delicacy of the twisted chimneys and ornate gables, which stand up sharply against the skyline. Barrington Court and Montacute House are both so well known and have so often been described that they require no more than a passing mention here.

The district with which we are immediately concerned lies due south of the high road between Curry Rivel and Taunton. It would be difficult to find three more interesting examples of Tudor houses on the smaller scale than Swell Court, Cathanger House, and Langford Manor; all lying within two miles of each other. The two former houses have well authenticated histories; but of Langford Manor little is known. It appears to have been through many vicissitudes, and to have frequently changed hands.

The house is situated at the foot of a hill about half a mile off the Taunton high road; it adjoins the Eastern boundary of the Parish of Fivehead. The principal approach is from the south-west side, from the road connecting Swell and Fivehead. The entrance drive to the house lies between two short massive square stone pillars, capped with a bold cornice and finished with ball terminals. The position of the drive was changed within the recollection of the oldest residents; formerly it was at right angles to the main road, and in a straight line with the South porch. The entrance pillars were moved at the same time, and were considerably reduced in height, which gives them a dwarfed appearance. On the south side of the house the grounds are intersected by a stream which, on the west side, runs between two well-defined stone walls. It is possible from the position of the house and general lie of the ground that this stream at one time was connected with a moat encircling the house; but all traces of this feature, if it ever existed, have now disappeared. The stream is spanned by a substantial stone bridge, with a culvert under, containing a sluice gate, which effectually controls the general level of the water. The south front of the house forms a species of courtyard with high walls on the east and west sides; this feature is not so fully developed as in some of the houses of this period. On the west side of the house, in a courtyard surrounded by outbuildings, are the remains of a columbarium (see block plan), only the outer walls are standing. The roof has entirely disappeared.

The house itself faces due south, and is in plan a double E, the centre arm of the E forming an open porch on each side.

The east and west projecting wings on the south side are of greater width than those occupying similar positions on the north side, where all the wings are of a more equal proportion. The south front is arranged on symmetrical lines; the windows are the only irregular features, many of these were blocked up with lath and plaster. The architectural details are all severely simple and could reasonably belong to the middle period of Tudor work. All windows throughout the house are formed with Ham hill stone mullions, the hood moulds and mouldings are of plain section, and are also of Ham stone. The general walling is of blue lias. The roof was originally covered, in all probability, with tiles; these have been replaced by a dark neutral-coloured slate. The unsympathetic texture and colouring of this roofing material has, to a great extent, been modified by a growth of orange lichen, which has been allowed to remain. The gables all stand clear of the roofs, and are coped with Ham stone; they are finished with Ham stone crow's-foot terminals, a very common feature in houses of this date in the district. The outer doorways of the porches are each spanned by four centred depressed arches in Ham stone, with very deep plain Ham stone lintels over; the lintel is finished on the upper side by a dripstone, mitred and returned down the sides, and returned again and stopped at the level of the springing of the arch. The arch and lintel are generally cut from one stone. The jamb mouldings, which are of the same section as those used in the reveals of the windows, die out on a splay, finished above the plinth by a delicately-shaped stop (it is noticeable that the same detail is repeated in the stonework of the window jambs, fireplaces, and entrance doorways throughout the house, with a slight variation in scale); these doorways are very effective, and are frequently found in houses of this date in the neighbourhood. The chimneys are, without exception, arranged on outside walls, and are designed on broad and substantial lines; the flues are grouped together with two outlets in each stack, but each flue is built independently of slabs of Ham stone, without any bond. It was no doubt owing to this method of construction that all the stone chimneys had perished; fortunately a fragment of one of the original chimneys remained, from which templates were taken of the mouldings for the purposes of the restoration; the only departure from the original work being that the stacks are built up of smaller stones bonded together, instead of, as formerly, in large slabs with straight joints.

Entering the house by the south porch one's attention was immediately arrested by the beauty of the massive inner oak door, with its plain wrought-iron hinges, and by the fine piece of oak panelling running between the two porches, the panels painted a bilious stone-colour, and the mouldings picked out in brown. This panelling belonged to a later date than the rest of the house. The most conspicuous feature of the small corridor hall was a modern staircase inserted in a cramped position, and forming the only means of access to the first floor. Entering by a deal doorway recessed in the oak partition, one was struck by the dimensions of the room disclosed. A fine six-light mullioned and transomed window takes up the greater part of the wall space of the west side. This window had evidently been lengthened during some former reconstruction, and the room itself modernised to its no small detriment.

The remainder of the west wing had been allowed to fall into decay for some considerable time. The south-west wing was cut off from the rest of the house, the only available access being by an outer door, which occupied the position of one of the original windows. The fine original oak and elm staircase (somewhat inconveniently placed in this wing) was in a well-nigh ruinous condition; fortunately it had originally been of a massive and simple construction. Only very plain detail was used in the mouldings, of which sufficient fragments remained to form a complete restoration of the original design.

The small square chamber, terminating the north-west wing, was originally planned with a lavish amount of window space in proportion to the size of the room. Two large four-light mullioned

and transomed windows occupy most of the north and west walls; several of the lights in these windows were blocked up with lath and plaster. This room is lined throughout with panelling of the Georgian period. The mouldings used are very simple. The principal feature is the fine-moulded cornice which runs round the room. A narrow modern staircase was inserted here communicating with the bedroom above.

The fine open stone fireplace was almost hidden by the panelling, which finished level with the stone jambs. On the left-hand side of the fireplace was the remains of an interesting feature. A semi-circular recess was formed in the thickness of the walling, and lined with studding, and finished with a plastered face; two wooden pilasters stopped the panelling on either side of the recess. Within the lines of the pilasters a semi-circular headed arch was turned in the panelling, with a delicately-moulded drop-pendant in the centre. Only the coved head of the recess remained; the portion below the springing had entirely disappeared. The panelling in this room was very much mutilated, the greater part of the cornice torn away, and the room itself used as an additional cut-house for pigs, etc.

The east wing was found, upon close examination, to contain several interesting features. The south room was evidently the original kitchen. The eastern wall, containing the chimney-stack (6 ft. in thickness) appeared to be quite solid. The room had been lined throughout with deal-studding and covered with canvas and papered, and a modern cast-iron fireplace, with a deal mantelpiece painted to imitate marble inserted. On removing the mantelpiece an original fireplace, built of Ham stone slabs, was uncovered, loosely fixed to hold the cast-iron interior; behind this again was a very much larger fireplace, set in the solid masonry, 5 ft. wide, of Ham stone, with a low four-centred moulded arch, and jambs, all in perfect preservation. The whole of the studding on this wall was then removed, and disclosed two narrow recesses on either side of the fireplace, 4 ft. deep, carried up to a height of about 5 ft. 6 in., and ceiled over. A wrought and chamfered Elm bressummer, black with age and smoke, 1 ft. 6 in. by 1 ft., ran the whole length of the room above the fireplace and recesses. Within the recesses two perfectly-formed baker's ovens were found, built in thin red oven-bricks, and set in the lias stone masonry; the ovens were eventually cleared away, and the two valuable recesses thus gained added to the dimensions of the room.

Upon stripping away the canvas from the partition separating this room from the passage, the whole of the inner partition was found to be of wrought elm panelling of early date, and of a rich dark brown colour; the uprights forming the studs 3 in. thick, 4 in. wide, and ovolo moulded at both angles, both sides grooved at a depth of about an inch from the face to form a rebate for the panels, which fill the intervening spaces. The uprights average 14 in. centre to centre, and run in unbroken vertical lines from floor to ceiling. Panelling of the same pattern was used in the dairy partitions (whitewashed) and at the side of the old staircase, and in two rooms on the first floor. The partitions across the landing at the top of the old staircase on the first floor was also of the same character. A doorway was formed in the partition, with a segmental moulded head, in the centre of which was a drop pendant. This partition was removed in order to open up the landing and placed in the entrance hall partly to shut off the corridor leading to the dining-room.

It is probable that the east wing at one time contained a second staircase, which would account for the position of a three-light window, the stone dressings of which can be clearly seen on the east elevation. This window comes midway between the ground and first floors, and is blocked up; all trace of the staircase has entirely disappeared. It is clearly evident that there were originally attics over the eastern wing, if not in other parts of the house. They were probably approached by the second staircase. All lights of all attic windows were filled up with lath and plaster. During the progress of the works a fragment of an interesting fireplace was uncovered in the large hall; one jamb was entirely cut away to allow for the insertion of the modern grate, which was put in by a former owner. The original fireplace was of the same design and date as the fireplace uncovered in the old kitchen. It measured 6 ft. 6 in. between the jambs, and the arched head was cut out of a single slab of Ham stone, 7 ft. 6 in. long by 2 ft. 7 in. deep; the height to the springing of the arch was 3 ft. 11 in. It was unfortunate that this interesting feature could not be preserved; but the disposition of the rooms in the altered scheme for the planning of the ground floor made its retention quite impossible.

While the alterations were in progress in the south-east bedroom, by stripping away some studding in the corner of the room, another recess, 6 ft. 7 in. by 4 ft., was opened out, extending to the full height of the room. The eastern wall of the recess contained a two-light mullioned window, blocked up with lath and plaster. This recess was immediately over one of the ovens in the old kitchen on the ground floor. It will be noticed, by referring to the first floor plan, that the only access between the east and west wings was by crossing the large bedroom between the two centre arms of the E and the west wing, a somewhat inconvenient arrangement. Otherwise the first floor was adaptable to modern requirements with very little alteration. In the passage between the rooms over the porches a small portion of an enriched plaster cornice of conventional design was uncovered; it had evidently been continued at the ceiling level, round the walls of the bedroom over the north porch, but the greater part has now disappeared. The levels throughout the house are curiously contrived. The large room on the ground floor, which was evidently the original hall, together with the small north-west room adjoining, are both 10 ft. 9 in. from floor to ceiling. The rest of the rooms on the ground floor are 8 ft. 6 in., with the exception of the rooms in the east wing, which have four steps down to them, and are 10 ft. 9 in. high from floor to ceiling. The loftier rooms in the east wing are accounted for by the fact that there is a fall in the ground towards the east. The difference in height between the old hall and the remainder of the rooms has necessitated two short flights of steps on the first floor. There is very little doubt that these were the original levels, as the sills of the windows have been arranged to correspond to the heights of the floors. All bedrooms on the first floor containing fireplaces had the original Ham stone chimney-pieces. In most cases these were disfigured by deal shelves, etc., but on removing these it was found in all cases that the deep Ham stone lintel was *in situ*, covered up by paper or plaster.

All Ham stone throughout the house inside was painted a sickly yellow, and all oak was treated in the same way; fortunately the uprights and balusters of the old staircase escaped. This part of the house was considered too far gone for renovation by previous owners, and was only used as a cider cellar. The outer walls of the house had been allowed to fall into a deplorable state of repair. The south walls were patched up with a poor description of rough cast, to act as a check to the driving rains coming from the south-west quarter. This front was almost covered with ivy, which was very reluctantly dispensed with. The ground on the north side of the house (where there is a considerable rise) had been allowed to silt up to such an extent that, in wet weather, the water flowed freely in at the doorway inside the north porch.

As regards the restoration, it will suffice to say that all unsightly modern features surrounding the house were removed where possible. Some necessary modifications were made in the inside planning of the ground and first floors. The external elevations were restored as far as possible to their original state. All windows were opened out and glazed in leaded lights in a similar manner to the old existing windows.

The chimney-stacks were rebuilt, as previously described, in Ham stone.

The restoration has been carried out under the direction of Mr. Rupert C. Austin, architect, of London. Messrs. Hutchings & Sons, of Ilminster, Somerset, were the contractors.

NOTES.

The Duke of York's Steps.

AFTER the adventurous journey of a horse and cab down the steps at the foot of the Duke of York's Column, we may reasonably hope that the Office of Works, or other responsible authorities, will see the advisability of fencing a somewhat dangerous declivity, to protect unoffending foot passengers as well as runaway horses and the persons who may be on or in the vehicles behind. Until London fogs have been abolished, another source of danger will continue to exist, namely, that the drivers of vehicles may lose their way and accomplish undesirably rapid descents into the Mall. That this is by no means an idle fear is shown by a letter to the *Times*, in which the writer states that some two winters ago he was on an omnibus which was only stopped

from accomplishing a journey of the kind by the vigilance of a police-constable. The cost of a railing would be comparatively trifling, and it is just as well that the steps should be protected to avoid any risk in the future.

Motor Cars and Smoke.

WE fully agree with the action of Mr. Denman in imposing fines upon several owners of motor-cars for permitting the emission of smoke from the exhaust pipes of their vehicles. As we said in a recent Note, the objectionable character of the vapour ejected is much increased when an excessive amount of oil is used for lubrication. One of the drivers told the magistrate at Marlborough-street that he supposed the smoke was due to oil being allowed to run on the hot parts of the engine, and the main point of the defence was that this constituted an accident and a temporary occurrence involving no penalty. While exhaust gases cannot be avoided in the case of oil and steam-motors, there is every reason why the owners of cars should be made responsible for seeing that their cars are constructed and managed so that smoky vapours are not emitted.

The Port of Liverpool.

IN his Report for the year ending June 30, the Engineer to the Mersey Docks and Harbour Board points to the progress made on various important works. More than 1,360,000 cubic yards of material have been removed as a preliminary to the construction of the Hornby Dock. Work at the new King's Docks has well advanced, and the Brocklebank Graving Dock, with the length of 804 ft., is practically complete. New graving docks at Tranmere Bay are progressing satisfactorily, and the Brunswick and Coburg Docks have been deepened to provide for vessels of greater draught. These works are, of course, quite apart from the great scheme to which we alluded a few weeks ago. As another illustration of the ceaseless activity shown by the Liverpool Port authorities, we have the fact that during the past twelve months more than nine million tons of sand have been dredged from the bar and principal channels, making a total of some eighty-eight million tons dredged since 1890. It is unfortunate for Liverpool that this heavy burden is imposed, but a good thing that a competent and energetic Board exists for maintaining the navigation channels and keeping the harbour abreast with the requirements of the times.

Another American Bridge Accident.

A SERIOUS railway accident which occurred last week in Virginia serves once more to remind the world of the flimsy character of many engineering structures in the United States. According to a telegram from New York, a bridge over the Elizabeth River collapsed under the weight of a heavy excursion train, the greater part of which fell into 25 ft. of water. Two similar trains had previously passed in safety, although eye-witnesses remarked that the bridge swayed ominously as the second train went by. In view of the lamentable loss of life caused by this disaster, it is to be hoped that American railway directors will make a point of strengthening or replacing the numerous remaining bridges that are really inadequate to withstand the stresses set up by modern rolling stock. English engineers have often been reproached for the strength and solidity of their structures, and unwise counsellors have recommended the American system of cutting things fine. So far as railway bridges are concerned, we can certainly afford to smile, being able to point to many fine works built in the early days of railway engineering, and as well able as ever to comply with the requirements of modern traffic. Some engineers in the United States have already learned to follow in our footsteps, but the work of eradicating the frail structures of the past proceeds far too slowly. A department like our Board of Trade, with ample powers and a fearless administration, would do much for the safety of railway travellers in that country.

Motor Racing on Roads.

IN a short report of the Herkomer Motor Race, which has appeared in the Press, it was stated that: "Unhappily, in consequence of the unprecedented dust referred to in yesterday's telegram, which still continues, a fatal accident occurred. In taking a corner near Herrenall, five miles from the start, a competitor ran down two children, killing both." We venture to think that, in the report of such an accident a few years or even months ago the actual and effective cause would have been put forward—viz., the unprecedented speed on a highway, and the motorist would not have been allowed to screen himself behind a cloud of dust. We trust motor races on roads will never be countenanced in this country, but it is a curious fact that, whilst we show an increased care of human life in every department, and legislation is directed to minimising its loss in connexion with railways, ships, and in factories and places of employment, loss of life in the legitimate use of our thoroughfares is being regarded with a laxity that is surprising. A little while ago a man who, by recklessness and solely for his own pleasure, caused the loss of human life, would have stood in jeopardy of being convicted of manslaughter, and of receiving a sentence of many years' penal servitude, with the loss of social recognition. Nowadays he shields himself behind a cloud of dust, or does a small term of imprisonment by deputy—in the person of his chauffeur. *Tempora mutantur.*

Electric Power for London.

THE main feature of the Parliamentary session which has just come to an end has been the number and importance of the electrical Bills (which have been discussed) in connexion with the supply of electric power to London. The most important of these Bills was the Administrative County of London Electric Power Bill, which, owing to the time taken in the Committee stage of the Bill, could not be passed into law last session. In its original form the Bill had many objectionable features, some of which we pointed out. After passing through the Committee stage nearly all of these had been eliminated, and, as the Company were prepared to consider the interests of the existing supply companies, and had entered into agreements with all of them, we think that the advancement of the use of electric power in London would probably have been accelerated by the passing of the Bill. Every one is agreed that this would be a boon to the community. Any one acquainted with the great printing works in the neighbourhood of Fleet-street will understand the many advantages that would accrue from the abolition of steam boilers and engines. This Bill will have to be brought up again next session, and, as the promoters have shown an accommodating spirit, it will probably become law. It would be well, however, for them to realise that there are many other electrical engineers who are prepared to design power stations with steam turbines coupled direct with three-phase alternators. The guarantee of their engineer also, that he can tell within 1 per cent. the quantities of energy used for power and lighting in any works simply by knowing the numbers of motors and lamps connected and the total energy consumed, is ludicrous. The North-East London Railway Bill received the Royal Assent on the last day of the session. The line authorised by this Act runs from the Monument through Shoreditch, Hackney, Leyton, Walthamstow, Chingford, and Waltham Abbey. The company's tubes between the Monument and Hackney road will be lowered, so as to permit another pair of tubes above them for providing communication between the east and west of London, in accordance with the recommendations of the Joint Committee on London Underground Railways in 1900. It is proposed to have a two-minute service between the Monument and Walthamstow, and a five-minute service over the remaining portion. The engineer's estimate of forty-four million passengers per annum seems to us to be large. Another electrical Bill passed is the Metropolitan Electric Supply Company's Power Act. The company will supply "in bulk" to authorised distributors, tramways, etc., but not to large manufacturers.

Powers of Local Authorities.

THE case of the Attorney-General *v.* Pontypridd Urban District Council is one of some interest to the general public. The defendants were the local authority, and, under the Provisional Order and the Electric Lighting Acts, had obtained powers for supplying the Urban District of Pontypridd with electric light. Acting under the powers thus conferred upon them, the Council had by agreement acquired a piece of land for the purpose of erecting thereupon a generating station. It was the intention of the Council also to erect on this land a refuse destructor, the idea being that the heat thus generated might be used in assisting to generate electric light. The Local Government Board advised the Council that it could not sanction the use of the land for a purpose other than that for which it had been acquired, but it is interesting to note that it was suggested that this difficulty could be overcome by a sort of legal fiction—that is, that the land should be sold and repurchased by the Council under

the Public Health Acts for the purpose of erecting the refuse destroyer. The Court, however, seems to have swept aside this transaction, and to have treated the case on the simple footing as to whether the Council had powers to use the land for a purpose other than that for which it had been acquired. The Court held that the two purposes were entirely distinct, and that the land, having been acquired under the statutes for electric lighting, in the absence of some express power granted by the Act, could not be put to any other purpose. The importance of this decision, as is pointed out in the judgment, lies in the fact that, when powers are sought, the object for which they are required should be disclosed, as otherwise they may be obtained without opposition for the purpose disclosed, whereas severe opposition would be offered to the scheme were it known that it included some other undertaking objectionable to the neighbourhood.

Drains. AT the Conference of the Sanitary Inspectors' Association a paper was read on "Combined Drainage," and a discussion ensued (reported on another page) on the desirability of amending the definition of the word "drain" in the Public Health Acts. In the result, a resolution was passed in favour of petitioning the Local Government Board to obtain legislation on the lines of section 42 of the West Ham Corporation Act of 1898. This section, however, appears to us to have been drawn in terms which rival the ambiguity of the Public Health Acts. It runs: "In and for the purposes of section 41 of the Act of 1893 the word drain shall be deemed to include any sewer or drain, whether constructed before or after the passing of this Act, with which two or more houses or premises, whether belonging to the same or different owners, are at the date of the passing of this Act or may at any time thereafter be connected, or which is used or capable of being or intended to be used for the conveyance of the drainage of such towns or buildings directly or by means of any other sewer or drain to any public sewer situate under a street repairable by the inhabitants at large, but shall not include any sewer which has been constructed to the satisfaction of the Corporation under section 152 of the Public Health Act, 1875, or any sewer which has been constructed by the Corporation for the effectual drainage of the borough." The Act of 1893, as well as the Act quoted, are private Acts, and it would be important to see what are the terms of section 41 of the former Act; but one point should clearly be borne in mind when the Public Health Acts come to be amended, and that is that the primary duties of the local authorities, and the primary object for which the rates are levied, are to provide the inhabitants of towns and cities with an adequate system of public drainage. Any attempt to throw the expenses of this on the private individual, and to expend the rates on other objects, should be stoutly resisted. Where the Public Health Acts are deficient, as at present framed, is that the private individual can, by connecting his drains with those of other houses, sometimes evade responsibility for drains properly his own, and throw the expense on the local authority. But it is clear it is neither equitable nor desirable that his liabilities should be extended outside certain limits, and legislation on this point will require careful consideration.

The Reading-Room, British Museum. PROPOSALS are already being made for celebrating the coming jubilee of the opening in May, 1857, of the general reading-room, of which, it appears, the erection was originally advocated by Professor Hosking—see the *Builder* of June 22, 1850, with an illustration, and the pamphlet, "Observations on the recent Addition of a Reading-room at the British Museum," fo: 1858. The circular apartment, 140 ft. in diameter, and roofed with a dome rising to a height of 106 ft., was built in the big quadrangle by Sydney Smirke, R.A., 1855-7. It replaced the former two reading-rooms in the block on the north side of the quadrangle into which the readers were admitted from Montague-place, and a revival of that means of public access would be a great convenience. Amongst the various projects for marking the anniversary is the fixing of busts or statues of the world's greatest writers upon the consoles around the wall at the springing of the iron ribs. The number must necessarily be limited to twenty, and what hope is there of agreement upon the selected names? A well-known reader suggests the separation of the seats with partitions, but that would reduce the present scanty space on the floor of the room; another advocates the compilation of a catalogue, with full references, of printed books which are not in the national collection and yet are known to be in existence elsewhere, either at home or abroad. We scarcely expect that the authorities would enter upon so vast an undertaking, or comply with similar pet projects relating to the books and the catalogues. Meanwhile there are more urgent and practicable needs to be considered, on behalf of the public and the executive staff alike. Measures should be taken to provide an improved system of ventilation. During the past fifty years or so the numbers of the readers have increased from 70,000 to 226,325 per annum, sanitary science has advanced in the meantime, and "museum headache" is a long-standing grievance. Moreover, the interior of the dome ought to be thoroughly cleansed and renovated; a scheme for its decoration was prepared we believe, by Alfred Stevens. The interior and plan are illustrated in the *Builder* of March 24, 1855. Baker & Fielder's contract amounted to about 100,000*l*. The rotunda of the Pantheon at Rome measures 142 ft. 6 in. across the floor, and rises to 142 ft. in the clear.

Advertisement Posters and Designs. AT the new offices recently opened by Messrs. W. H. Smith & Son, at 12, Norfolk-street, Strand, an exhibition is being held, by way of inauguration, of advertising drawings and designs. The requirements of the advertiser have opened up an entirely new field to the enterprising printer, and he will now have to prepare himself, not only to produce high-class work, but to render an advertising service to his customer, suggest ideas, and provide him with drawings. The drawings on view are by Messrs. John Hassall, Cecil Aldin, Fred Taylor, R. Pannett, Lewis Baumer, S. E. Scott, R. P. Gossop, Chas. Pears, H. Rowntree, and a large number of the leading draughtsmen and designers of the day. Almost without exception they are extremely clever and effective, and the exhibition goes a long way to prove that English poster-artists are now no whit behind the French, the past-masters of poster art. Charming faces and dainty figures by Messrs. Baumer and Pannett, Chas. Pears' inimitable children, Hassall's quaint figures, and the series of well-drawn portraits and posters by Taylor, together with numbers of others equally well-deserving of mention, form an exhibition well worth a visit, and which should prove of especial interest to the intending advertiser.

The late M. Bouguereau. THE death of M. Bouguereau will be regarded by some lovers of art with indifference, by others as leaving a serious vacancy in the ranks of eminent French painters; according as painting is regarded as a means of poetic expression and suggestion, or as a highly developed craft. As an executant in his art Bouguereau was a painter of quite exceptional attainments; his drawing was faultless, his finish of execution exquisite; and if his colouring was somewhat cold and dead, colour is a matter of inspiration and not of craft and training. Perhaps it is an instance of the truth of Mr. Clausen's dictum (which we rather questioned at the time) that colour is the element by which a painter's real greatness is decided, that Bouguereau, whose colour was his weak point, was an example of a painter of high accomplishment whose works nevertheless totally failed to interest one: "uninteresting" was the word that rose to one's mind in connexion with almost all his pictures. It is a mistake to suppose that this was because his subjects—his "Nymphs," "Amours," "Jeunesse's," etc.—were necessarily in themselves uninteresting; such subjects can be made interesting enough, as many extant examples prove; it was the cold, correct, Academical manner in which they were treated that froze the spectator's sympathies. But while we condemn the coldness, we ought to honour the correctness of Bouguereau's execution. In days when there is a great deal of slip-slop execution in art, a painter who upheld a standard of thoroughly competent execution should at least have credit for that. And if he was without poetic suggestiveness, physical beauty he could at all events realise. His Salon picture, two or three years ago, of a nude figure reclined on the shore with a breaking wave behind her (the latest edition of a subject he painted several times), displayed a face and figure of really exquisite beauty. Some of his pictures of cottage children (his other class of subject) were also of great grace and sweetness of character, and may perhaps come to be more valued than his nymphs.

He evidently gave the public what a large section of it, at all events, wanted, for he amassed a large fortune.

IMPRESSIONS OF HAMBURG AND LÜBECK.

(FROM A CORRESPONDENT.)

IT is suggestive to place Hamburg and Lübeck together for the purpose of contrast, since Hamburg represents the highest type of German modern commercial cities, with its large and imposing offices, its warehouses and immense docks; Lübeck, the mediæval port, with its gates, its churches, its small river, and its ancient Rathaus. Hamburg also has its Rathaus, but it was not begun to be built until 1884, and it is in some internal details still unfinished. Hamburg being a Free City, as are Lübeck and Bremen, is, in a word, a state within the German Empire, and its citizens, as do those of the other two Free Cities, govern themselves to a greater degree than do those of any other German or English city.

As a port Hamburg is, more especially at the present time, of much interest, since it is a keen rival to London, and, it must be confessed, is likely to be a match for it. It is exceptionally well situated, for the Elbe on its southern side has several branches which extend like fingers from the hand, giving natural harbours. In addition to these, sub-harbours have been formed on the north and south sides, so that the Elbe at Hamburg resembles a stalk or branch, the head of which is the railway bridge, and below, branching to right and left, are numerous "hafen." The weak point of Hamburg as a port for passengers is that there is no quay as at Southampton where passengers can land and embark close to a main line of railway. But approach Hamburg from the sea on a fine summer evening, when the light has mellowed and a slight haze softens the outlines of buildings and ships, and it is a striking and remarkable sight. The houses and churches of Altona and Hamburg, the large looming hulls of many steamers, the masts and rigging of the sailing ships, the passing craft, some large, some small, moving without cessation up and down and all over the surface of the Elbe. In Hamburg itself the main characteristic to be noted is how its greatness as a commercial city in the Middle Ages has been continued under altered forms to the present day. Striking bits of old Hamburg are to be seen in many places along the quays, in some of the side streets, and in a few of the canals, such as the picturesque Deich Strassenfleth, which is like a bit of Amsterdam or Haarlem. Look down a canal and at the end you see a group of old buildings with rows of windows one above the other narrowing floor by floor till in the apex of the gable comes the termination in a single aperture. But these ancient buildings are lost amongst the large and often stately modern buildings, of which the new offices of the Hamburg-American Steamship Company are typical. A well-proportioned and fine building in the Classical style, it stands on the Alsterdamn overlooking the Alster Bassin, a large lake which forms the centre of the towns of Hamburg and Altona, which are structurally a single city. On this sheet of water many small steamers, sailing and rowing boats are plying, the banks edged north and south with an avenue; whilst at the upper end the Lombards Brücke divides it from the Aussen Alster, another and larger lake, with an area of 430 acres, which is, in fact, the debouchment of the small river Alster, which used to find its way through unhealthy marshes to the Elbe, and now joins the larger stream after it leaves the small Alster Lake through a canalised course. This large lake is surrounded by agreeable and often imposing mansions with shady gardens touching the water, more resembling the "cottages" of the rich American merchants at Bar Harbour and other places in the United States than anything we have in England. This may seem a digression from the place where we started—the offices of a famous steamship company; but, standing as these do in sight of the houses of the chief Hamburg citizens, overlooking the water and its pleasure-seekers, having in view the shops and restaurants of the town with the high tower of the Rathaus at no great distance, it typifies not only the way in which the commercial and the general life of Hamburg is intermixed, but the way also in which it is architecturally harmonious. Above the portal of the building are engraved the suggestive, and one may say, applying them to Hamburg of the past and the present, true words, "Mein Veld ist die Welt."

Spaciousness is perhaps the most striking feature of Hamburg; it is exemplified not only in the central parts which have just been mentioned but all over the city. To this must be added a singular cleanliness and attempts, not unsuccessful, to use any opportunity of making the town agreeable to the eye. This is well exemplified in the long quay, called the Versmann Quai. Here the waterside is lined by large sheds, cranes, and other appliances for loading ships; behind them a line of rails, next to and separated from this by a low railing is a bicycle track, then a roadway, and then a broad footway, along which plane trees are planted. Fortunately, too, Hamburg is free from all forms of wall or "sky" advertisements—a fact tending much to the dignity of a great town.

Many cities can show as fine streets of shops as Hamburg, and it is rather in such a building as the chief Custom House that we see the wealth and importance of Hamburg most significantly displayed. If with this class of building we couple the Rathaus or Town Hall, with its Parliament and Senate Chambers, its Banqueting Halls, and other rooms which would be worthy in design and decoration of a royal palace, we shall best appreciate the way in which, commercially and architecturally, Hamburg still upholds and enlarges its past characteristics.

A little more than an hour's railway journey brings one from Hamburg to Lübeck. The change of architectural atmosphere is apparent the moment the station is reached, when the twin towers of the Holsten Thor are seen barring the way to the town. Lübeck is quiet, ancient, and individual. It should be studied carefully by every architect, for there, more than perhaps in any other town, the use of brick as a building material has been brought to the highest perfection. New houses are, at Lübeck, built after the style of the old buildings, so that the harmony of the town is retained. The use of brick as a material cannot be better studied than in the Marien Kirche. This church is exteriorally disappointing. Those accustomed to take note of ecclesiastical stone buildings in the Gothic style cannot but feel the flatness and the absence of artistic details; but, after all, it makes one also feel how rich England is, in that in every other village the most delightful examples of Gothic architecture are to be found. But within the Marien Kirche there is no disappointment, and the spaciousness, the charming lightness, the graceful simplicity, of the whole, with its lofty and slender pillars, the simple lancet windows, give one a feeling of admiration for the way in which the architect has used his material.

It is not intended to give a catalogue of the contents of the church; it will be sufficient to state three points. The first has, indeed, already been referred to—the treatment of brick in the Gothic manner. The next is the unique character of the monuments. Nearly every one has in the centre an oval portrait, which is surrounded to various degrees by monumental sculpture. A favourite form is for some allegorical figure on the left hand to hold the portrait, opposite is another figure, and so the whole monument is gradually built up as in that of Johannes Sirricio (1696). Every pier is adorned in this way, and in some places the walls. The monumental brasses, fine specimens of the German manner, are the third feature of this church. The brasses are large; that to Abraham Hoeven, of the date of 1571, is about 8 ft. by 4 ft., and they are in truth pictures on brass. In this instance large-sized figures of a man and his wife fill the lower part of the brass; behind the man are grouped other minor figures, and above angels in various forms are visible. The spaces between the figures are filled by foliage and tracery. Interesting, however, as are these and similar brasses, they are artistically failures, for the medium employed is unsuitable for this form of artistic treatment, which is never more fitly employed than in the simple and severe figures of knights and their ladies which are the chief subjects of English brasses. The pictures, on the other hand, on these brasses are flat and inanimate. Similar attempts may occasionally be seen in England in some small churches, as at Bletchley and Tingewick, Buckinghamshire; but, except for a few rare examples, such as the remarkable Flemish brass to Abbot Delamere at St. Albans, brasses of the size and character of these in the Marien Kirche and of that to Bishop Tiedman in the cathedral are unknown. The Cathedral, it may be said in passing, is of small importance in comparison with the Marien Kirche.

Again, in the Rathaus, the use of tiles as a material as well as brick externally is most noticeable. The vestibule and staircase spaces are supported by pillars of dark-blue tiles, and the vaulted roof is of the same material. Some restoration of imperfect parts has taken place; but the Rathaus dates from 1442, and we see it pretty much as it was when erected in the XVth and XVIth centuries. The external staircase (1594) shows marks of the influence of the Renaissance, but the main feature for an architect to note is the manner in which brick and tiles have been used. In the interior the minute wood-carving of the Kriegstube (1595) would in itself be worth a tiring journey to see, the door, in either side of which are two large figures, being of the most minute and ingenious work At the opposite end of the room the fireplace and its surroundings vie in skill with the entrance carving. But, marvellously clever and admirable as is all this work, from a decorative point of view it is not so excellent a success, for the woodcarving is so minute that it has no large effects at a distance, and, though beyond praise in detail, it gives no individuality to the chamber as a whole.

These two buildings in the centre of the city, one ecclesiastical and the other secular, give the keynote to all the architecture of Lübeck. A walk up the Breitstrasse confirms the first impression. Here on the right is the Hospital zum Heiligen Geist. A chapel of the XIIIth century has been converted into an entrance hall; like the Marien Kirche, it is of brick, with light pillars and a vaulted roof. Somewhat further on the left is the former house of the Schiffergesellschaft, of the Guild of the Seamen. Over the doorway is carved a ship in full sail, and below it is the date 1537. The inside is used now as a tavern, but the old quaint carving of ships and of the sea still exists, and from the ceiling depend old models of old-fashioned ships. Perhaps no place retains more than this quaint building the atmosphere of Mediæval Lübeck. A few steps further and the Burgthor stands at this end of the ancient town—a quaint brick edifice, dating from 1444, with picturesque wings showing signs in its decoration of Gothic sympathies, though the tower itself is of the domestic character and is purely North German in style. The middle and modern ages thus in Hamburg and Lübeck exist in singular contrast and suggestiveness in either city. An aristocracy has not created these interesting towns, but a society of merchants and shipowners. In either city tradition still produces its social and architectural effects, though in Hamburg we see the traditions of centuries in more vital form than in Lübeck. There are many cities in Germany remarkable as examples of modern and mediæval architecture; but in Hamburg and Lübeck, each of them out of the ordinary field of the tourist, there is an opportunity for the study of architecture applied to commerce and local government of a special character and of much historical antiquity.

BUSINESS PREMISES, BELFAST.—The new premises of Messrs. Crane & Sons in Wellington-place, Belfast, are now completed. The contractors for the erection of the building were Messrs. Courtney & Co., Belfast, and the architects were Messrs. Young & Mackenzie, also of Belfast. The ironwork in connexion with the staircases and lift was made by Messrs. Riddels, Ltd., and the plumbing was executed by Messrs. John Dowling & Sons. The electrical work has been executed by Messrs. Wilson Brothers & Co., under the superintendence of Mr. John Woodside, A.M.I.E.E.

THE SANITARY INSPECTORS' ASSOCIATION.

AN autumn meeting and conference of the Sanitary Inspectors' Association was held on Wednesday, Thursday, Friday, and Saturday last week at Carpenters' Hall, by permission of the Worshipful Company of Carpenters. Between 200 and 250 members attended the various meetings. Wednesday was devoted mainly to committee meetings, but in the evening the President (Sir J. Crichton-Browne) received the delegates at Caxton Hall, Westminster. The Conference opened on Thursday morning.

Presidential Address.

Sir J. Crichton-Browne, in the course of his presidential address, said that one of the hopeful signs of the times is the popular interest that is manifested in health questions. This is as it should be, for the intelligent co-operation of all classes is needed in carrying on the great work of sanitary reform. Having dealt at considerable length with the question of food in relation to physical deterioration, the President said they could not sit with hands crossed waiting for the golden age to be conferred by any Government or Commission. They must strenuously persevere in their endeavours to ameliorate the condition of the people, and this they could best do by improving their environment in the widest sense. It was with environment that they as sanitary inspectors were officially concerned, and he was sure that they had already, by their uphill labours, left their stamp on the condition of the people. Their duties as sanitary inspectors brought them into intimate contact with the people of all classes, and he thought they would agree with him that the condition most urgently affecting them at the moment was that of housing. From all parts of the country came complaints of overcrowding in wretched dwellings, and, particularly in the great centres of population, they were growing at a rate that could no longer be overlooked. Heavy were the penalties we paid for these housing conditions and this overcrowding, in combination with other insanitary influences that appertain to towns. Proceeding, the President touched on disease and death statistics in towns as compared with the country, and also referred to the question of the decadence of character and of intelligent leadership. Personally, he was inclined to think that intellectual decadence, if it be upon us, is not necessarily destined to deepen as time went on. As things are now, the country is in many parts guilty of sanitary offences as heinous as those of the towns, and is only saved from the consequences by the fresh air and unpolluted sunshine it gets. Private enterprise has failed to furnish anything like adequate accommodation for agricultural labourers, and owing to heartless indifference, indolence, or official obstruction—perhaps in some degree also to their own complicated ambiguities—Acts of Parliament, such as the Housing of the Working Classes Act of 1890, have remained practically in abeyance. But, in spite of all this, the country, measured by every standard, remains more salubrious than the town. He had been contrasting the merits of town and country from a health point of view, and the conclusion might be that, while the country is entitled to the preference of the sanitarian, both are urgently in need of his attentions. Excellent work had already been done in both, but much remained to be done, for the greatest wants of the moment are remedies to relieve the pressure caused by the increase of population in urban centres. They were acquainted with the remedies which have been proposed for that state of things—viz., regulations directed against overcrowding, the acquisition of special areas by the authorities for the obligatory rehousing in the same neighbourhood of those disturbed under Parliamentary powers, and the acquisition by municipalities of vacant land for the construction of suitable dwellings. These are excellent as far as they go, but seemed to him to be palliatives rather than remedies. They shifted the load a little, but did not really lighten it, and it had been, perhaps, the perception of their futility that had led to the half-hearted manner in which they have been applied. Real relief is only to be obtained by establishing an outflow from the centre to the circumference, and it is by affording increased facilities of locomotion that this may be done. It is to the new motive power that is now advancing with such giant strides that we must look for the removal of some of our housing embarrassments. Railway extensions, tube railways, surface and subsurface tramways, and motor omnibuses and cycles will inevitably bring into existence a number of new suburbs around our big cities, to which, if the cost of transit is kept low and rents remain moderate, many of the poorer classes who are not compelled to live near the factory or shop will resort, all the more readily if a shortening of the working day gives time for the journeys to and fro, and if associations are formed to help them to become the owners of their houses. And to these suburbs, should the cost of transit and the time occupied by it or high rents prove prohibitive to the working classes, the well-to-do will in numbers retreat, making room for their humbler neighbours in the inner circles. It is probable, too, that these new suburbs would in some degree intercept the streams of population that are perpetually flowing into the towns from the country, showing that, as regards London at any rate, immigrants settle mainly in the most outlying parts. The new suburbs of towns would, of course, always spring up on lines of communication and where facilities were offered for building speculation, and spread out around, but it is to be hoped that they will be taken in hand in time, and means devised to limit their indefinite expansion.

Growth of the Suburbs.

Mr. Charles Booth had said that towns advancing show a noticeable tendency to shoot out tongues like the sun's corona, the intervals between them being filled up later, and it was this filling up of the intervals between them that should, if possible, be prevented. Island suburbs are well enough, but when they swell out, become continuous, and form a girdle round the parent town, they aggravate its evils, and help to strangle it. It has been proposed that air should be supplied to the centre of great cities by mechanical means, but infinitely preferable to any such artificial arrangement, necessarily finical and liable to break down, is a liberal scheme of natural ventilation. There should be maintained in connexion with all great cities a series of broad avenues converging towards them from all the points of the compass, free from buildings, and covered with vegetation. The parks and open spaces in these cities are called their lungs, but the lungs are not of much use without the windpipe, and the green avenues would act in that capacity, and allow an inrush of fresh air and the escape of the vitiated air which is always accumulating in cities. These avenues should be clothed in vegetation, and, to his thinking, the preservation of vegetation, not only around our great cities, but throughout the country generally, is becoming a matter of grave import. It was to the rise of the suburb—the island suburb—set in a sea of chlorophyll easily accessible, well planned, honestly built, that we must look in the first instance for the removal of some of the afflictions that overcrowding had brought upon us. But the suburb, while it might do much, cannot do everything, and there were other sources of relief which it was their duty to turn to and to improve. They must take measures to reduce the influx of population into our already congested towns, and to keep on the land those who have been born and brought up on it and to bring back to the land those who have inconsiderately left it. And there were several ways in which this could be done. They could create new cities on new sites, with all the advantages and none of the drawbacks of the old ones—garden cities of the type so eloquently and convincingly advocated by Mr. Howard, in which the needs of industry and the needs of humanity will be reconciled. Charles Kingsley in his philanthropic ardour foresaw something of the kind, for he dreamt of cities—which should be "a complete interpenetration of city and country, a complete fusion of their different modes of life, and a combination of the advantages of both, such as no country in the world has ever seen." And his vision had come to pass. They had Bourneville and Port Sunlight—cheering oases in the industrial desert—and, better still, they had Letchworth, gradually coming into being, on a broader basis and with greater amplitude of design. Letchworth was still incomplete, but two visits to it had enabled him to appreciate the judicious way in which it had been mapped out, the excellence of all its sanitary arrangements, and the rapid progress it was making. It was full of promise, and it would be a national calamity should any want of financial support prevent the project in its entirety from being carried to a successful issue. It was to provide for 30,000 inhabitants, and that would not be much of a depletion for congested London; but, whenever Letchworth was an accomplished fact, other garden cities would be undertaken. Another way in which they could tap their great cities of their clogging superfluities of population was by establishing in their dominions beyond the sea land colonies under some such scheme as that so ably excogitated by Mr. Rider Haggard. But the best of all methods, and the most promptly available for checking overcrowding in towns, was by improving housing in the country. They were told that the flower of the agricultural class flock to the towns because they dislike the monotony of country life and long for excitement and variety. That was so, no doubt, to a large extent, and perhaps their present system of education was calculated to foster discontent with the peasant's lot, and engender vague ambition, restlessness, and a thirst for rousing stimulants; but he suspected that another contingent of country folk found their way into the towns, not so much attracted by its glamour as repelled by the dingy wretchedness they left behind them. Agriculture was, after all, the most varied and least monotonous of employments, and could the cottages of the labourers be made wholesome and attractive and the village life invested with some interest, many who now migrate to the towns would stay at home, and many who are in the towns and have tried them and failed would be glad to be taken back to the land.

Rural Housing.

It was to rural housing, more especially in its relation to the relief of overcrowding in towns, that he had intended to direct their attention, but his excursions into the approaches to that subject had left him only a few minutes in which to touch on it. The main point, however, was—and on that he had already insisted—that by improving their country cottages and adding to them cottages of an approved type they should in some degree check the exodus from the country and even set up a back-wash from the towns. And in order that they might do that they must have amendment of the building by-laws, that have been in no small measure answerable for the depopulation of rural districts and for the congested state of towns. That these by-laws require to be overhauled and remodelled no one who had read Mr. Wilfred Blunt's article in the *Nineteenth Century*, or the speeches made by the members of the deputation that waited on Mr. Walter Long, then President of the Local Government Board, in November last, could doubt. The unfortunate clause in the Public Health Act of 1875, providing that poor law districts might declare themselves urban districts and so acquire powers similar to those exercised in towns and frame by-laws of their own, had been the source of all the mischief. Under this clause half the rural districts of England have acquired urban powers, which, being exercised by persons having for the most part an interest in urbanising the district—jobbers in residential land ripe for development, tradesmen, contractors, and local builders—had been used as an instrument to prevent the erection of dwellings suitable for agricultural labourers, and to tie the hands of landowners willing to provide such dwellings. No better example of this could be adduced than Mr. Wilfred Blunt's own case. Having himself experimented with an iron bungalow, which he found singularly comfortable and commodious, he directed his estate agent to erect on his property in the New Forest, where there were no builders' by-laws, two cottages, intending, should they prove successful, to make them the model for cottage building in Sussex. And highly

successful they proved. He found they could be erected at the cost of £130 for a building covering 700 ft. area, with a verandah of 240 ft. more and an outbuilding containing wash-house and closet—"as snug and sanitary a home as any poor man could wish to inhabit, for there was a fireplace in every room, roof ventilation, and ample door and window space." But when Mr. Wilfred Blunt came to Sussex, where the London building by-laws were in force, there was a lion, and a very fierce lion, in the path. The plan of a cottage was submitted to the rural council, and no objection was taken to it until the building materials had been deposited on the ground. Then, however, notice was given that the plan was disapproved by the council as violating the by-law. This notice Mr. Wilfred Blunt thought it his duty to disregard, and went on with the cottage, which cost £130, and which, with an addional quarter of an acre of land, he could let without loss at 2s. 6d. a week, or 1s. a week less than an old cottage it replaced. But alas for rural economy! The builder was summoned for building with other than bricks and mortar, and an action was brought against Mr. Wilfred Blunt, as a result of which a continuing penalty of 2s. a day was inflicted on him until the model cottage was pulled down. It was clear that a check must be administered to rustic Bumbledom, and a stop put to the application to purely agricultural areas of regulations intended for towns, and which in towns had had an altogether salutary effect in preventing the construction of unsafe and insanitary houses. But he could not go so far as some who had urged that there should be no by-laws in country districts, or that such by-laws should not apply to any new building on a freehold property where such building was more than a given number of yards from other dwellings or past the property of adjacent owners. In regard to sanitary arrangements, by-laws seemed to them as necessary in the country as in the town. It was not licence, but reasonable liberty, that was wanted; not looseness, but elasticity, and it was to be hoped that this would be realised in the model code of by-laws for rural districts commenced by Mr. Walter Long, and in which cottages in certain situations were to be permitted of wood or other materials.

The Letchworth Cottages.

Continuing, Sir James advised every sanitary inspector concerned in rural housing to visit Letchworth and study the buildings erected there diligently. He would there have an instructive lesson, and be able to satisfy himself that a serviceable and comely cottage, in all respects suitable for a labourer or working man and his family, could be built for £150, including builder's profit. He would there see cottages of many different patterns and built of many different materials—of stone, wood, brick, iron, concrete, cement, steel, and plaster in various combinations—and would obtain from the catalogue full information about the price and specifications of each. He would see a marvellous display of ingenuity and contrivance in the filling in of domestic requirements and of making the most of next to nothing. No doubt his critical eye would detect flaws here and there, but everywhere he would perceive an intelligent deference to the claims of modern sanitation. The cottages varied greatly; each had an individuality of its own, but sunniness and airiness and cosiness characterised almost all of them. They appealed to many tastes, but to no tastes that were vulgar or debased. They were pretty, but their prettiness was subordinate to their vitality; they were picturesque, but not pretentious. Simplicity and cleanliness were the dominent ideas, and they were cheap with a cheapness that was unbelievable until they had been actually seen and examined, and compared with the estimates. Think of a detached cottage, well proportioned and artistic in design, with a living-room with range 15 ft. 6 in. by 11 ft. 4 in., parlour with mantle register 10 ft. by 8 ft., scullery with bath (hot and cold water) 9 ft. 4 in. by 7 ft. 6 in., three bedrooms 9 ft. high, 13 ft. 4 in. by 9 ft., 13 ft. 4 in. by 9 ft., and 8 ft. 6 in.; with pantry, two cupboards, coal-hole, shed for wood, water-closet, water laid on, drains connected, rain water-butt, floor of scullery and pantry tiled, and say if it was dear at £150. A survey of some of these cottages at Letchworth, so quaintly pretty, so minutely commodious, so hygienically correct, so reasonable in price, suggested that they should have attractions for the well-to-do not less than for the labouring class. Perched on some beetling cliff or breezy down, bosomed in some bosky dell, or planted in the fields neighbouring some quiet hamlet, they would form a delightful week-end or holiday resort for families of moderate means. The farmhouse had, no doubt, many advantages as a holiday retreat, but the cheap cottage, as a family seat and permanent possession, was infinitely superior. He hoped that some of his sanitary inspector friends in the large towns might see their way to acquire one, in some suitable locality, of well-selected plan, and, with some small attractions and additions such as they would well know how to devise, raising the price somewhat upon that of the Letchworth model, but still leaving it within the category of cheapness. Such a dwelling should be a source of health and pleasure, and also a good investment.

A hearty vote of thanks was accorded the President for his address, on the motion of Mr. Baldwin Latham, seconded by Mr. Smith (Blackpool), and the Conference afterwards accepted an invitation to meet at Blackpool next September.

Examination and Training of Sanitary Inspectors.

Mr. H. H. Spears (chairman of the Midland Centre) contributed a paper on "The Present System of Examination and Training of Sanitary Inspectors," in which he particularly referred to the existing practice of granting certificates, and pointed out that now the Sanitary Institute, the Sanitary Inspectors' Examination Board, the Victoria University of Manchester, the Liverpool University, and possibly others, all hold examinations and issue certificates of competency. Some local authorities prefer one certificate and some another, while a large number are absolutely indifferent as to whether the candidate possesses any qualifications whatever for the position he holds. With such an anomalous state of affairs it was not surprising that the Executive Committee of their Association should have consulted the district centres as to the desirability of assimilating the qualification of provincial and metropolitan inspectors. Despite, however, the apparent advantages of this step, it was a noteworthy fact that provincial members generally had evinced a decided disinclination to pledge themselves to support the assimilation proposal. He hardly knew that they would be acting wisely to espouse the principle of the restriction of the right to hold examinations to one body. The ideal system, so far as they were concerned, would be that the examination board should be constituted by their Association, but, failing this, he thought they might very well consider the claims of other bodies to share in the work of examination.

Considerable discussion followed the reading of the paper, in which Messrs. Quinton (Manchester), Humphreys (Reigate), Peers (Wolverhampton), Young (Battersea), Cowden (Liverpool), G. Anderson (Middlesbrough), McMahon (Torquay), Ablett (Woking), Martin (Burslem), and Miss Carey (Westminster) took part.

Mr. Young said the executive committee was making inquiries and getting information, and it was hoped that before long they would place some definite line of action before the Association. In the meantime he thought it would be well to leave the matter in the hands of the committee.

Mr. G. Anderson thought that they owed thanks to the Sanitary Institute for stepping in twenty years ago and instituting examinations. Their complaint of the Sanitary Institute was that it had not moved with the times, and looked more to fees than to competency.

The President remarked that what was wanted was a central board on which various authorities would be represented, similar to the General Medical Council.

Sanitation of Cow Sheds.

Dr. William Daley (Bootle) followed with a paper on "Some Points Connected with the Sanitation and Management of Cow Sheds and Dairies," in the course of which he laid great stress upon the necessity for ventilation. He laid it down that the practical difficulties connected with efficient ventilation cannot possibly be overcome if the air space of the shippon is less than 600 ft. per cow, but a well-ventilated shippon with this amount of cubic space is infinitely more wholesome than one with twice its capacity if not properly ventilated.

London Main Drainage.

Sir Alexander Binnie, formerly Chief Engineer to the London County Council, had prepared a paper on "London Main Drainage," which in his absence was taken as read. The author described the history of the system, the gist of which was contained in his address at the conference of the Institute of Public Health, reported in the *Builder* of July 29. On the general question of the disposal of sewage, however, the author stated that, having studied the question very carefully for the past twelve years, the conclusions he had arrived at were as follows:—(1) That, as far as possible, all solid and floating matter should be removed from the sewage by mechanical means, for although undoubtedly these solid and suspended matters would ultimately be destroyed by the micro-organisms, yet the time required would be too long to admit of its application in ordinary cases; (2) that, as far as possible, such minute suspended matter still remaining in the sewage should be reduced by the aid of those organisms with which we are well acquainted from the solid to the fluid state. This, to his mind, was the first step and the first lesson which they had clearly learned from their investigations into this wonderfully interesting subject. The effluent sewage containing, then, a large proportion of dissolved organic matter was in a condition to be further treated either by intermittent filtration in which were called contact beds or by some other means being brought into contact with those organisms which had the mysterious power of reducing these dissolved organic substances, which if left to themselves would putrify and be the cause of offensive smells, if not of dangerous consequences. In the case of intermittent filtration and contact beds, considerable difficulty arises from the presence in the effluent along with the dissolved organic matter of certain mineral substances in a minute state of subdivision, derived, no doubt, from the washing of the streets. These latter substances, of course, could not be acted upon by any species of bacteria; consequently, in course of time, they tended to clog up the filter beds themselves. But intermittent filtration and contact beds was not the only mode of treating the sewage effluent which had been deprived of its grosser and more palpable organic matters. It was a well-known fact that if the sewage effluent be poured into a sufficiently large volume of otherwise comparatively pure water the dissolved organic matter contained in it disappeared with remarkable rapidity; in other words, the contact bed, instead of being composed of coke or other solid matter, was formed of water, in which the mysterious process of the reduction of the dissolved solids was carried on. Of course, it was to be understood that the water into which the sewage effluent was discharged must be of large volume and in constant motion, and it was to this latter process that the success which had attended the London sewage works was to be attributed. No doubt these works were not perfect, and at the present time required enlargement, but the success which had attended the work of the past eleven years was a sufficient guarantee that, if the surrounding circumstances were suitable, this mode of treatment was almost as good as any which at the present time could be suggested.

In the afternoon the party were taken by steamboat to the Crossness outfall works of the London County Council, and were conducted over the works by Mr. Beale, the Chief Resident Engineer, who explained the process.

Popular Instruction in Sanitation.

On Friday the conference was resumed, when Mr. James Brand (delegate of the Sanitary Inspectors' Association of Scotland) read a paper on this subject. The

author urged that not only should habits of personal cleanliness be inculcated into the minds of school children, but the cleansing of the school building might also be made a means of instilling habits of cleanliness and orderliness in children. He thought that instruction should not stop short at the children, but that ministers of religion, medical men, and sanitary inspectors might seek to educate adults.

Sanitary Inspectors and Biology.

Mr. F. C. Lewis (University of Liverpool) had prepared a paper entitled "A Biological Contribution to the Sanitary Inspector's Education," which in his absence was read by Mr. E. C. Tidman. The author referred to the necessity of a wide knowledge of things, and to the advisability of a man not confining himself to the study of that which was obviously part of the every-day work, but of going along the by-ways of learning and seeking to know more of those things which influenced such every-day work. Perhaps no other branch of biology was more important than the work which dealt with bacteria. Mr. Lewis proceeded to draw attention to the action of bacteria on foods, etc.

Combined Drainage.

Mr. I. Young (Battersea), in the course of a paper on this subject, said it was of the greatest importance both to provincial and metropolitan sanitary authorities—to the former on account of the great cost incurred in reconstructing and maintaining the drains of private property at the public expense, and to the latter owing to the difficulties experienced in securing the abatement of nuisances. Without wearying them with legal decisions, he might say the fault lay in the definitions of the word "drain" more than in the decisions which had been given from 1894 onwards. The root of the whole question was the necessity for an amendment in the law rather than to expect that the administrators of it should find what was clearly defined as a "sewer" to be a drain. In section 4 of the Public Health Act of 1875 they were defined as follows:—"Drain" means any drain of, and used for the drainage of, one building only, of premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by persons is conveyed. "Sewer" includes sewers and drains of every description, except drains to which the word "drain" interpreted as aforesaid applies, and except drains vested in or under the control of any authority having the management of roads, and not being a local authority under this Act. That Act did not apply to the Metropolis. As regarded the Metropolis, by section 250, a "drain" was defined to mean and include any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed, and shall also include any drain for draining any group or block of houses by a combined operation under the order of any vestry or district board. A "sewer" is by the same section defined to "mean and include sewers and drains of every description except drains to which the word 'drain' interpreted as aforesaid applies." It might be assured that at least 60 per cent. of the houses erected in the Metropolis between 1856 and 1896 were drained by combined operations, and lack of supervision by the authorities rather than any intention of the owners had resulted in a permanent burden being played upon the ratepayers to keep such systems in repair. It was not until 1903 that the sanitary authority could demand plans, etc., to be submitted, and this undoubtedly was responsible for the existence of so many unsanctioned combined systems being laid down. There was the further fact that alterations to drainage systems subsequent to their original construction were responsible for many of the sewers now existing on private property. Although such alterations had been made surreptitiously in many cases, the burden of maintaining such systems rested with the sanitary authority, and this must appear to everyone the greatest of all anomalies in connexion with this vexed question. That, where the authority was able to prove a combined system had been laid down by the approval of itself or its predecessors, the owners are liable, but where no such consent can be shown it was itself responsible even for a stack pipe conveying the rain water from two or more roofs not within the same curtilage. Such a case was decided in the Court of Appeal on April 7, 1903 (Silles *v.* the Fulham Borough Council). He had examined the records of the Commissioners of Sewers, who were in power from 1847 to 1855, and combined systems of drainage laid prior to 1847 it might generally be assumed were sewers for which the local authorities were responsible. Mr. Young submitted some drawings illustrating the position as it operates in the Metropolis, in which the anomaly of "premises within the same curtilage" was clearly shown. One was the use of a large house originally in one curtilage and drained separately to the sewer. Years after it was built the house was divided into two separate properties. No alteration in the drainage was necessary, and it was not until a nuisance arose in the drain that any question as to liability for repair was raised. Notice was served, and it was decided that the portion which was originally a liability of the owner to repair was simply by the alteration in curtilage decided to be a sewer, for which the sanitary authority was liable. Coming to the question of expense, Mr. Young showed that the cost of repairing combined systems of drainage upon private property as "sewers" had been to the metropolitan borough councils from 1900 to 1904 inclusive 116,444*l.* 1s. 8d. This was exclusive of Holborn and Westminster. During the past nine years the metropolitan authorities had striven their utmost to secure an alteration in the law. At the instigation of these bodies the London County Council in five sessions of Parliament introduced the "Metropolitan Sewers and Drains Bill." This Bill encountered considerable opposition, and a difficulty was experienced in getting members of Parliament to take charge of the measure, and it had to be finally abandoned. The London County Council, when advising the authorities of this decision, stated that it was one with regard to which the borough councils should themselves seek legislation upon. The various local councils, continuing their action, secured an interview with Mr. Walter Long, the President of the Local Government Board, on June 18, 1903, the metropolitan borough councils being represented by nearly sixty members. A very strong case was made out by the representative speakers, the fiscal importance of the case being strongly urged, together with the fact of the impossibility of sanitary authorities being unable to engage a sufficient staff of sanitary inspectors to prevent systems of drainage being converted into sewers. It was further pointed out how impossible it would be for each council individually to present Bills in Parliament to deal with a common question, and that it was therefore a question with which the Local Government Board alone could effectively deal. To recapitulate the main points of Mr. Long's reply, the question, he admitted, was by no means free from difficulty, and agreed that a very strong case had been made out. Generally speaking, he said "it does not seem to me that there ought to be in fact and in law any confusion between two things which appear to me so essentially different as a sewer and a private drain." With regard to a sewer which the local authorities have to maintain, they ought to be masters both as to its situation, construction, and everything connected with it before they should be responsible for it, much less to be responsible for its maintenance. Further, he stated he recognised the justice of the demand that the Government should legislate, that it would be ridiculous for any one borough council to introduce a Bill, and promised that he would give to the solution of the difficulty his most careful and earnest consideration. Since this interview much additional information had been furnished to the Local Government Board, but no official action appeared to have been taken by the Board. In conclusion, he would only reiterate the points that combined drains were laid by owners for economy and private profit. They were never intended to be maintained by the community, being constructed generally without any communication with or the knowledge of the local authority or Commissioners of Sewers, who consequently never had the opportunity of making the required satutory order in regard thereto. It was visibly illogical to assume the Legislature intended to throw such a burden upon ratepayers, when the cost of maintenance of drains made pursuant to an order was expressly laid upon the owner. Another point deserving attention was the increased activity of local authorities since the passing of the Public Health (London) Act, 1891, in ascertaining the existence of nuisances and securing their abatement. If some remedy was not found for abating nuisances arising from defective combined drainage without inflicting the cost upon the ratepayer, there was the danger that a less energetic discharge of these duties might arise, and the public health would in consequence suffer. Having regard to these facts, it was curious that, whilst the metropolitan authorities had been striving to obtain, but without success, the relief required, the West Ham Corporation, whose boundaries adjoin those of the Metropolis, has secured relief in a private Bill promoted in 1888. As during the past six years he had seen no remedy suggested which, in his opinion, met the case so well as this clause, both in regard to the difficulties obtaining in the Metropolis and the provinces, he ventured to suggest that the Association petition the Local Government Board upon the matter asking for legislation upon the lines of clause 42 of the West Ham Corporation Act of 1898, which ran as follows:—"In and for the purposes of section 41 of the Act of 1893 the word 'drain' shall be deemed to include any sewer or drain, whether constructed before or after the passing of this Act, with which two or more houses or premises (whether belonging to the same or different owners) are at the date of the passing of this Act, or may at any time thereafter be connected, or which is used, or capable of being or intended to be used, for the conveyance of the drainage of such houses or buildings directly or by means of any other sewer or drain to any public sewer situate under a street repairable by the inhabitants at large, but shall not include any sewer which has been constructed to the satisfaction of the Corporation under section 152 of the Public Health Act, 1875, or any sewer which has been constructed by the Corporation for the effectual drainage of the borough."

Mr. H. Alexander (Shoreditch) moved the following resolution:—"That this Congress is of opinion, having regard to the anomalous condition of the law relating to sewers and drains, to the inequitable costs imposed on local authorities, and to the obstruction experienced by sanitary inspectors in the discharge of their duties by the abuse of the law, that an amendment thereof is necessary for a proper settlement of the distinction between sewers and drains, and that such amendment should be on the following lines:—(1) That the existing definition of the words 'drain' and 'sewer' as contained in the 250th section of the Metropolis Management Act, 1855, and the 112th section of the Metropolis Management Act, 1862, the 4th section of the Public Health Act, 1875, and the 19th section of the Public Health Amendment Act, 1890, should be repealed. (2) That the Local Government Board be memorialised to introduce a Bill in Parliament enacting, firstly, the repeal of the aforesaid definitions; secondly, enacting that the word 'drain' shall mean all pipes or other conduits for drainage which may have been or shall be hereafter constructed or reconstructed on private or public premises by persons other than a local authority or county council, or the predecessors of such bodies, and shall include that part of such conduit which extends from the premises to a sewer; and that the same shall be deemed to have been constructed at the expense of the owner or owners of the various premises drained in combination, and shall be maintained and kept in good condition at the expense of such owner or owners jointly. (3) That the

word 'sewer' shall mean and include all pipes and conduits used for drainage of every description, except those to which the word 'drain' interpreted as aforesaid applies; and shall include such pipes and conduits as may have been constructed by private persons, but which have been taken over by a local authority or county council, or the predecessors of such bodies. (4) And that the aforesaid enactment shall apply to the Metropolis and to the whole of England and Wales."

Mr. J. T. Quinton (Liverpool), in seconding the resolution, said they were all agreed that a more explicit definition was required, and in that opinion they were supported by the highest legal mind in the land. It must be clearly obvious that sanitary inspectors in advocating a change in the law could have but one desire, which was the welfare of public health. Again, no officer could have greater opportunities for seeing how the present law encumbered the local authorities in dealing with matters affecting the public health than those who were daily entrusted to carry out the duties under the various Acts, by-laws, and regulations. It was, therefore, well within the sanitary inspector's province to call attention to the present anomaly as to what was a drain and what a sewer. Many local authorities had been fully alive to the existing anomaly, and had seen the necessity of removing the impediment in the way of improvement, and Mr. Young had quoted the clause which the West Ham Corporation obtained in 1898. Liverpool had also a clause in their Act of 1902, which was as follows:—"Where two or more houses or other buildings belonging to the same or different owners are connected with the public sewer or a cesspool by a single private drain, an application may be made under section 41 of the Public Health Act, 1875, relating to complaints as to nuisances from drains, and the Corporation may recover any expenses incurred by them in executing any works under the powers conferred on them by that section from the owner of the houses or buildings, and such expenses shall be recovered summarily or may be decided by the Corporation to be private improvement expenses under the Public Health Act, and may be recovered accordingly. For the purposes of this section the expression 'drain' includes a drain used for the drainage of more than one building, whether belonging to one or more owners." It would be noticed that both the West Ham and the Liverpool clauses could only be brought into operation for the purposes of section 41 of the Public Health Act. The powers possessed by the two corporations might have been secured at considerable expense, but they had secured a great advantage for themselves when dealing with nuisances arising from drains. If such powers were required for Liverpool and West Ham, why not for the rest of the country? Things were in an absurd state now. For instance, there might be thirty houses all belonging to one owner having a main drain to convey the drainage of the houses to the public sewer. On the other hand, they had two houses drained by one drain to the public sewer. The owner of the thirty houses had the main drain maintained by the local authority, while the owners of the two houses must keep the drain in good condition.

Mr. Duck (Woolwich) said that the unfortunate aspect of the case might possibly seriously affect the health of the inhabitants. He supposed that in all the old districts of London the inspectors would not have the slightest difficulty in finding in these old drains some of the vilest and worst that could be imagined, but to refer these to the sanitary authority to be dealt with would be fatal, as it would mean that whole districts would have to be redrained by the local authorities at enormous expense. He thought, however, that they had better not themselves seek to suggest the clauses, and if Mr. Alexander's clauses were to be put into an Act difficulties would arise at once. He would like to know what was the meaning of "taking over" by the sanitary authority, although he presumed that those drains for which the local authorities had paid 116,000*l.* had been taken over. He suggested that they had better leave the drafting of clauses to lawyers.

Mr. Mort (Cheshire) thought the importance of the question of what was a drain and what a sewer was such that it should not be shelved, and that some satisfactory definition should be given.

Mr. Wells (Newcastle) expressed his opinion that it would be well to expunge the words "belonging to different owners" from the section.

The President thought this was no legal, but a practical and logical question, and what the lawyers had to do was to put in plain language the practical knowledge of such gentlemen as those before him. It seemed desirable that, whatever the requirements were, they should be in force all over the country.

Mr. Young said he was opposed to the resolution. They were not lawyers, and to tell the Local Government Board how they ought to deal with this question seemed to him unwise. They might direct the attention of the Board to the West Ham clause, which had been in operation for seven years and had worked well.

Mr. Alexander denied that there was any wish to dictate to the Local Government Board, but the clauses might be suggested to them. Mr. Duck knew what was meant by taking over a drain. A large number of drains had been remodelled by the local authorities, and were then taken over by them as sewers.

Mr. Young moved as an amendment—"That the Sanitary Inspectors' Association petition the Local Government Board asking for legislation upon the lines of clause 42 of the West Ham Corporation Act of 1898."

The amendment was carried, and the Conference rose for the day.

A final meeting of the Conference took place on Saturday morning, when votes of thanks were passed to those who had extended hospitality to the visitors and to the Carpenters' Company for the use of the hall. On Friday afternoon visits were paid to St. Thomas's Hospital for an inspection of the Shone new patent system of drain and soil pipe ventilation, to Messrs. Doulton's Pottery, and to the works of the Absolute Smoke Prevention Syndicate. On Saturday the works of the Sanitas Company at Limehouse were visited.

ADAPTATION OF HIGHWAYS FOR MODERN TRAFFIC.*

IT must be apparent to the most casual observer that many of the existing highways of this country are sadly in need of improvement, in order to adapt them for rapid traffic, such as has been introduced with self-propelled vehicles. The fact that some of the existing carriageways have remained in their present condition as a menace to life and limb for so many years reflects great discredit on highway authorities.

Many authorities allow buildings to be brought forward in such a manner that ultimately large sums of money have to be expended in order to widen highways which must eventually form arterial thoroughfares. The author knows of many cases in and about the Metropolis where, within the last thirty years, owners offered land to highway authorities, either without payment or for a nominal sum, for the purpose of widening highways, provided the authorities did the paving; but the so-called economist of those days had not the nerve to undertake such paving, the consequence being that now buildings have been erected these widenings become matters of necessity, and hundreds of thousands have to be expended where hundreds would have sufficed some few years since.

By-laws, and so far as the author is aware, local Acts, make no provision for the rounding of corners at the intersection of roads, even in the case where such roads are being laid out. The author has been much struck with the great difficulty experienced in getting local authorites to appreciate the necessity of wide highways and the rounding off of corners, and he has been met with such arguments as that Ratcliff Highway, which is only 30 ft. wide, carries more traffic than any road in his district, and why, therefore, should he insist on a wider road—and this not from an ordinary member of the council, but from an eminent member of the engineering profession.

It would be well if some provision were in force to compel highway authorities to have new streets so laid out that every portion of the carriageway is visible from every other part of such carriageway, which is within a distance of at least 100 ft., and that at the junction of any two carriageways the same rule is observed as if they formed the same street. The reason of this provision is, that vehicles approaching should see each other at as early a period as possible, so as to give every opportunity of avoiding collision.

Steep inclines form a great source of danger for all forms of wheel traffic, more especially when roads meet on inclines or at, or near, their lower termination. The author knows of nothing that shows the absurdity of having a uniform rate of speed allowed for vehicles more than the case of steep inclines, especially when it is remembered that on many of these inclines not a single week passes without accidents, which if not accompanied by loss of life or personal injury, results in considerable damage to rolling stock and fences, which shows that it has been due more to good luck than otherwise that personal injury has not accrued. Authorities should therefore endeavour as far as possible to have streets laid out so as to reduce inclines, and where roads intersect to round off corners next the higher portion of the incline to as great an extent as possible.

Surface.

The surface of carriageways is a matter which requires considerable attention, not only to carry horse traffic in comfort, but more especially to ensure safety and comfort to cyclists and motorists. The surface should therefore be as even as possible, and although all carriageways should be properly arched, there should be no excessive arching, such as would lead to the centre of gravity of vehicles being placed dangerously near the outer wheel. No gully gratings should be allowed in the carriageways, but gullies should be placed beneath the paths, with a proper weir formed in the kerb to take the water on to such grating; this leads to the necessity for provision being made to prevent mains being placed beneath the paths in such positions as to interfere with that suggested for the gulley-pans.

Many persons look on motors with pneumatic tyres as causing considerable damage to highways. They are no doubt the cause where carriageways are badly constructed in the first instance, or are badly maintained; but the author knows of no form of traffic which causes less damage to carriageways, provided the surface is properly laid and a proper state of moisture maintained. This will be seen on a main road taking a large quantity of motor traffic on a spring or autumn morning when the carriageway holds just sufficient water; a beautifully smooth surface will result from the constant rub of the pneumatic tyres; a very large amount of tonnage is thus carried with a minimum amount of damage to the carriageway.

There is no doubt that when railways became the great carriers of the country the question of our highways became a matter of secondary consideration; in fact, in too many cases they were neglected to an extent that must have damaged many interests. This state of affairs is rapidly changing, as our carriageways have, with the introduction of self-propelled vehicles, become a great means of conveying the wealthier portion of the pleasure seekers. At the same time, the introduction of heavy motor traffic is being instituted for the carrying of goods, a class of traffic which must of necessity increase enormously. Local authorities, if they wish to remain highway authorities, must, therefore, make up their minds that the ordinary country road, which in years gone by was never subjected to a load exceeding 2½ to 3 tons, will in the near future be subjected to loads of at least ten times this amount, and that any attempt to prevent these loads traversing their roads at seasons when injury is likely to be caused cannot be maintained. The only step for such authorities to take is to form their highways in such a manner as that at all seasons they are capable of bearing heavy traffic, and, above all, to see that all new streets and roads are so laid out that they will carry heavy traffic at all seasons.

* A paper read by Mr. C. H. Cooper, of Wimbledon, at the annual meeting of the Incorporated Association of Municipal and County Engineers, held at Norwich, June, 22, 23, and 24.

This work may appear to involve at first sight a large capital outlay, but the author can only state that in his own district, in which, he is happy to say, there are now very few roads without proper foundations, the cost of maintenance of roads properly formed is far less than that of roads without good foundation, and that the difference in cost of maintenance per mile more than compensates for the cost incurred in properly forming the highways in question. There are obstructions which should be avoided as far as possible, viz., the placing of lamp-posts and sign-boards close to the carriageway. These should be placed in such positions as not to interfere with the use of the whole of the carriageway, which they do if placed in such position as to engage overhanging loads.

Footways and Bridle-Paths.

Although the title of this paper may not entitle the writer, he cannot conclude a paper on highways without referring to the neglected state of footways and bridle-paths throughout the country. Now that our carriageways are being converted more or less into engine tracks, the solitude of these paths forms a most pleasing contrast to the danger and flurry to which our highways are subjected, and the author thinks it is a matter which reflects very severely on highway authorities that in many cases they take no steps whatever to prevent these footways and bridle-paths being closed—viz., Ermyn Street, the Roman road crossing Epsom Downs and Mickleham, Surrey. Others are so overgrown with trees as to be perfectly useless. The author knows of many in which one would be above his knees in mud were he to attempt to traverse them. Whilst highway authorities have of necessity to lay out money to accommodate the pleasure-seeking motorist and cyclist, the author considers that the equally deserving individual who is still satisfied with the means of locomotion that the gods have allotted him has quite as strong claims on the rates expended on highways as the individual who can afford 1,000*l.* for a motor. But whereas hundreds of thousands of pounds are laid out to provide for the comfort of the latter, not one penny piece, so far as footways and bridle-paths are concerned, is laid out for the former. There is no doubt that this is to a large measure due to the desire on the part of landowners to attempt to close, as they do in many instances, footways and bridle-paths.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—On Saturday last week the members of the York Society of Architects visited Sheffield in order to see some of the buildings which have been recently erected for educational purposes. Chief among these are the new University buildings in Western Bank. Here the visitors were joined by many members of the local society, and the combined party was conducted over the building by the architect, Mr. E. M. Gibbs. Before proceeding to the detailed inspection, the party assembled in the Firth Hall, where Mr. Gibbs gave an account of the various materials used in the erection of the buildings, and explained how the requirements of the various departments had affected the general arrangement. At the conclusion of the inspection the party left by special tram-car for Nether Green Council School, where the members were met by Mr. A. F. Watson, the architect of the building, who conducted them round, and explained the arrangement of the school. An adjournment was then made for tea.

CLUB PREMISES, FLEET.—New premises are being built for the Fleet Club, at Fleet. They will have a frontage of 30 ft. and a depth of 96 ft. Mr. H. Love is the architect, the builder being Mr. S. Vass.

SAFETY OF THE PUBLIC IN THEATRES.—In a recent number of the *American Architect* was published an article, with illustrations, describing a novel method of getting an audience out of a theatre in case of fire. One of the essential provisions was a second fire-resisting screen, which was claimed as a new idea of the inventors. In 1903 the London County Council suggested a second fire-resisting screen for the improvement of Drury Lane Theatre, but it was waived at the recent arbitration.

Illustrations.

LANGFORD MANOR.

THESE illustrations are given in connexion with the article on Langford Manor, which appears on another page.

MUNICIPAL BUILDINGS, LAMBETH.

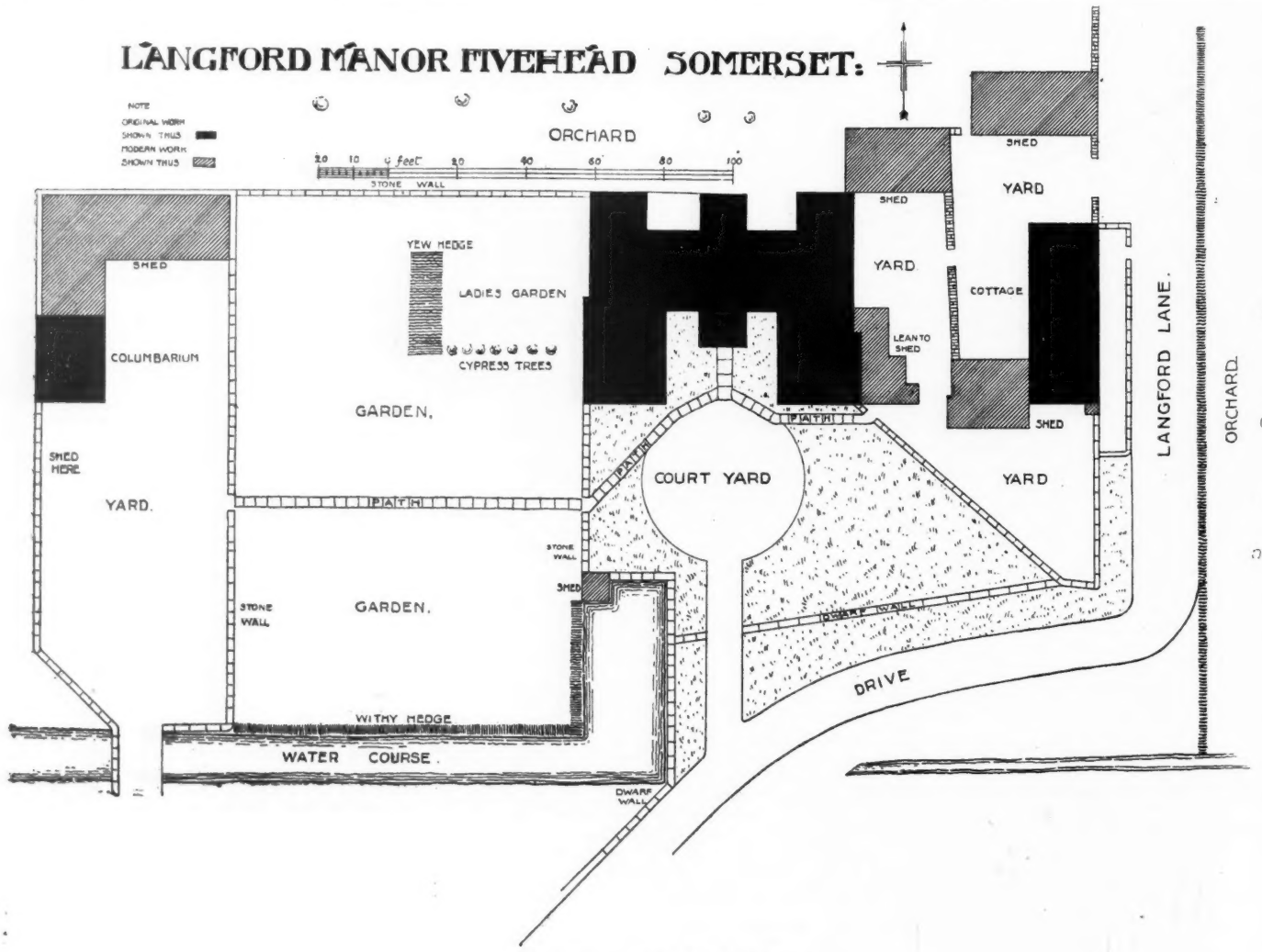
THE design illustrated was one of those placed by the assessor. The conjunction of the two streets at an acute angle suggests the lay-out on a triangular basis; it gives a symmetrical treatment to the façades in Brixton-road and Acre-lane, and also leaves a rectangular plot, some 95 ft. wide by 160 ft. deep, for any future building it may be decided to erect hereafter. The plans sufficiently explain the working out of the scheme, but it may be noted that each department is *en suite*, and the main corridor round the three sides of the triangle gives easy and direct access to the various rooms, and the council chamber being placed in the centre is carefully secluded, and free from the noise of traffic, etc. The treacherous and watery nature of the subsoil has influenced the design in so far as to exclude the adoption of any basement (except a small part for stores), the building being planned on two floors only—*i.e.*, ground and first floor. The perspective clearly shows the external treatment of the building. The materials proposed were bright red facing bricks, with Portland stone dressings, the windows being double hung sashes, placed on the outer face of the wall.

H. V. ASHLEY & WINTON NEWMAN.

ORGAN CASE, ST. PAUL'S SCHOOL.

THIS organ case was erected in St. Paul's School as a memorial to the late Professor Jowett, who was an old Pauline.

The general design is by Mr. T. R. Spence. The bronze bust is the work of Mr. R. Hope Pinker. The wood-work was executed by Messrs. Gaire & Sons, of Aberdeen; and the heraldic shields and pipe decoration by Mr. L. J. Spence.



Block Plan of Langford Manor.

TESTS OF THE BRITISH FIRE PREVENTION COMMITEE.

TESTS were undertaken by the British Fire Prevention Committee on the 16th and 17th insts. The Committee's own experimental test with a concrete floor, 5 in. thick, supported by heavy broad-flange girders, protected by 2 in. of concrete (the concrete being of an aggregate of one cement to two sand to two ballast), definitely demonstrated the unreliability of a rich concrete aggregate containing ballast. The floor was loaded 2½ cwt. per foot super., and fired for four hours, followed by steam fire-engine stream for five minutes for classification as "fully protective" (class B). The main girders were laid bare and deflected considerably during the fire, and two of the bays collapsed upon application of water. This experimental test with non-proprietary work was of a most interesting character, it being possible closely to observe the peeling away of the concrete, the action of the flames, and disintegration on the application of water.

The test with the "Faber" floor was a two-and-a-half hours' test, followed by the application of water for two minutes—*i.e.*, for classification as "fully protective" (class A). The load was, hence, 2 cwt. This floor showed the application of the principles of reinforced concrete to a floor of hollow semi-porous bricks, the reinforcement being by rods laid crosswise. The detailed report will give the particulars of the result, but, summarised, it can be said that the floor obtained classification by not allowing fire and water to pass through, although the floor was severely damaged, and the rods laid bare during the testing operations.

The roller-shutter door test with the "Kinnear" shutter was a test for one and a half hours, followed by the application of water for two minutes, for classification as "partially protective" (class A). This classification was attained, as neither fire or water got through the shutter, although the shutter buckled severely. The flames, however, got over the top. We understand that the makers are putting forward a further shutter for test. The size under review was 9 ft. by 8 ft.

The test with the partition erected by the National Fireproofing Company was for classification as "fully protective" (class A), which requires a partition not thicker than 2½ in. to withstand fire for two and a half hours, followed by water for two minutes. This partition obtained classification, neither fire nor water passing through, although it showed cracks and bulged.

In all these tests the temperature had to attain 1,800 deg. Fahr. The last-named tests were in chambers 10 ft. by 10 ft. in plan. The Faber floor was in a chamber measuring 22 ft. by 10 ft., and the experimental test was in the Committee's new large chamber, measuring 22 ft. by 15 ft.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council, held on July 31, being the day before the Council adjourned for the summer recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Committee's order of reference. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—The retention of an iron and glass shelter at the Adelphi Hotel, John-street, Adelphi (Messrs. Jeffries & Co.).—Consent.

Rotherhithe.—Buildings on the southern side of Lower-road, Rotherhithe, opposite Neptune-street (Messrs. Newman & Newman for the Guardians of the Parish of Bermondsey).—Consent.

Dulwich.—An open wooden porch at No. 34, Croxted-road, Dulwich (Mr. W. M. Brutton for Mr. J. Gardner).—Consent.

Wandsworth.—A building on a site on the northern side of Garratt-lane and western side of High-street, Tooting (Mr. H. J. Marten for the Council of the Metropolitan Borough of Wandsworth).—Consent.

Wandsworth.—That the application of Mr. C. de Gruchy for an extension of the period within which the erection of additions to the Union Church, Upper Richmond-road, Putney, was required to be commenced, be granted.—Consent.

Woolwich.—A Welsh Congregational Chapel on the northern side of Willenhall-road, Woolwich (Mr. J. M. Peate).—Consent.

Brixton.—Three houses on the eastern side of Willington-road, Brixton (Messrs. McIntosh & Co. for Mr. E. M. Hayward).—Consent.

Haggerston.—Buildings on the site of Nos. 25, 27, 29, 33, 35, and 37, Hackney-road, Shoreditch, to the line in Hackney-road (Mr. J. E. Saunders for Messrs. Howard Wall & Co. and Creeds Trust).—Consent.

Hampstead.—A bay window and a balcony railing at a house to be named "St. Ann's," in course of erection on the eastern side of Redington-road, Hampstead (Mr. C. H. Saunders for Miss R. Thomas).—Consent.

Islington, East.—Two projecting hoods over the entrances of Nos. 46 and 48, Elwood-street, Islington (Mr. R. Hancock).—Consent.

Kensington, South.—A verandah in front of No. 3, Campden-hill, West Kensington (Mr. J. W. Legge for Mrs. Morgan).—Consent.

Paddington, North.—Bay windows to a proposed block of flats on a site between No. 401, Edgware-road and Cuthbert-street, Paddington (Messrs. Done, Hunter, & Co. for Mr. H. Ward).—Consent.

Wandsworth.—Houses in Cowick-road and Coteford-street, Tooting (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Strand.—The retention of three wood and glass showcases in front of No. 1, Piccadilly-circus, St. James's, Westminster (Mr. A. Oldcorn).—Consent.

Hampstead.—The retention of one-story buildings on the eastern side of West End-lane, Hampstead, northward of West Hampstead station (Mr. E. P. Seaton for the Metropolitan Railway Company).—Consent.

St. Pancras, North.—One-story shops on the forecourts of Nos. 123 and 125, Fortess-road, St. Pancras (Mr. T. Frazer for Mr. T. H. Hawkins).—Refused.

Wandsworth.—A motor-car shed at "Beeleigh," West-hill, Wandsworth, to abut upon Dromore-road (Messrs. Barton & Theobald for Dr. C. Banting).—Refused.

Kensington, South.—The rebuilding of South Kensington Station, Cromwell-place, Kensington (Mr. G. Sherrin for the Metropolitan and Metropolitan District Railway Companies).—Refused.

Lambeth, North.—An open letter sign at No. 235, Westminster Bridge-road, Lambeth (Mr. L. Wood for Mr. Arthur).—Refused.

Lewisham.—Iron and glass porches over the entrances to houses in Boyne-road, Lewisham (Messrs. H. & G. Taylor).—Refused.

Lewisham.—A building on the north side of Elmer-road, Catford, eastward of No. 74 (Mr. H. Woodham & Sons for Mr. H. Woodham).—Refused.

Marylebone, East.—An iron and glass shelter in front of St. George's Hall, Langham-place, St. Marylebone (Mr. J. G. W. Buckle for Mr. J. N. Maskelyne).—Refused.

Strand.—The rebuilding of Nos. 133 and 135 and Nos. 137 to 167, Regent-street (Messrs. R. C. Harrison & Son).—Refused.

Width of Way.

Hammersmith.—A forecourt fence at St. Vincent's House, Queen-street, Hammersmith (Messrs. H. F. Tasker & Slater for Madame M. Dubois).—Consent.

Hackney, North.—A one-story stable building and the retention of a wooden gantry at the rear of No. 401, Kingsland-road, Hackney, at less than the prescribed distance from the centre of the roadway of Derby-road (Mr. G. Carter for Mr. A. Weibking).—Consent.

Hackney, Central.—A building on the west side of Holly-street, Dalston, southward of No. 71 (Mr. D. P. Hayworth for Messrs. S. Hayworth & Sons).—Consent.

Peckham.—Three buildings on the south side of Wagner-street, Peckham (Mr. J. P. Choate for Mr. B. Gale).—Consent.

Hampstead.—Retention of a motor-shed and glass roof at "Northcourt," College Villas-road, Hampstead (Mr. W. Scott).—Refused.

Width of Way and Line of Frontage.

Marylebone, West.—The rebuilding of the Western Ophthalmic Hospital, Marylebone-road, St. Marylebone, with external walls at less than the prescribed distance from the centre of the roadway of Circus-street, and to the line in Marylebone-road (Mr. W. Harvey for the Committee of the Hospital).—Refused.

Width of Way and Construction.

Lewisham.—A wood and iron building at the rear of No. 57, Tyrwhitt-road, Lewisham (Mr. J. Cox for Mrs. A. Fenton).—Consent.

Lines of Frontage and Construction.

Bow and Bromley.—The retention of the wood and iron street fire-station on a piece of land on the north side of Wallis-road, Hackney Wick, at the corner of Windsor-road (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

Kensington, North.—Permission to retain a bicycle shed, adjoining No. 13, Colville Houses, Talbot-road, Bayswater (Mr. W. H. Burnet for Mr. A. H. Meiklejohn).—Refused.

Width of Way, Line of Frontage, and Construction.

Rotherhithe.—The erection of two fixed gangways and three travelling gangways across Pickle Herring-street, Rotherhithe, and of a steel-framed platform, on the south-west side of that street (Messrs. Stock, Page, & Stock).—Consent.

Width of Way and Buildings for the Supply of Electricity.

Hackney, North.—An electric light sub-station on a site abutting upon the west side of Edward's-lane and south side of Lordship-terrace, Lordship-road, Stoke Newington (Mr. W. F. Loveday for Stoke Newington Borough Council).—Consent.

Widening of Street and Deviation from Certified Plans.

Strand.—New buildings on the site of Nos. 59 and 60, Pall Mall, and 1, Crown-court, Strand, and the widening of Crown-court (Mr. E. G. Dawber for the London and Lancashire Fire Insurance Company, of Liverpool and London).—Consent.

Space at Rear.

Lambeth, North.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of Nos. 8, 9, and 10, Lower-marsh, Lambeth (Mr. W. H. Roger).—Consent.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the north side of Theodore-road, Hither Green-lane, Lewisham (Mr. E. Willson for Mrs. Moore).—Consent.

Means of Escape from the Top of High Buildings.

Strand.—Deviations from the drawings approved in respect of the means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act from the (fifth) top and fourth stories of Nos. 1 and 1A, Cockspur-street, and Nos. 18 and 19, Pall Mall East, Strand (Waring White Building Co.).—Consent.

Formation of Streets.

Battersea.—That an order be issued to Mr. W. M. Wilkins, sanctioning the formation or laying out of a new street for carriage traffic to lead from Theatre-street to Latchmere-road, Battersea (for the Council of the Metropolitan Borough of Battersea).—Consent.

Strand.—That an order be issued to Mr. J. W. Bradley, sanctioning the formation or laying out of a new street, for foot traffic only, to lead from Bow-street to Cross-court, Strand (for the City of Westminster).—Consent.

Woolwich.—That an order be issued to Mr. M. Fitzmaurice sanctioning the formation or laying out of a new street for carriage traffic to lead from Church Manorway to Harrow Manorway, Plumstead (for the Main Drainage Committee of the Council).—Consent.

Lewisham.—That the application of Mr. P. Roche for an extension of the period within which the erection of houses with shops on the eastern side of Springbank-road, Hither Green, between Nos. 11 and 53, were required to be completed, be granted.—Agreed.

Islington, West.—That the Council do not consent to the application of Messrs. Lee & Pain-Clark, on behalf of Sir John Poynder Dickson-Poynder, for permission to erect a hoarding at the end of Widdenham-road, Islington, next Stock Orchard-crescent.—Agreed.

Woolwich.—That an order be issued to Mr. A. H. Hutton refusing to sanction the formation or laying out of a mews at the rear of houses in The Slade, Plumstead (for Mr. C. Curtis).—Agreed.

Buildings for the Supply of Electricity.

Westminster.—That the Council do consent to the application of Mr. C. S. Peach for permission to retain for a further period the temporary iron chimney shaft at the electricity generating station, Millbank-street, Westminster.—Consent.

OFFICES, SUNDERLAND.—The Sunderland and South Shields Water Company are having new offices built at Sunderland, at the corner of John-street and Borough-road. The architects are Messrs. W. & T. R. Milburn. Red Carse Hill sandstone is the material employed in the structure. The contractor is Mr. J. B. Stott, and the cost of the work will be about 10,000*l.*

ROMAN CATHOLIC CHURCH, HAYDOCK.—The foundation-stone was laid recently of the New Church of the English Martyrs, which is being erected at Haydock. The church is estimated to cost 1,850*l.* exclusive of decoration and furnishing. It will accommodate 450 worshippers, and is being erected in the Early English style, with grey bricks externally, relieved with terra-cotta dressings. The architects are Messrs. Curran & Son, of Warrington, and the contractors Messrs. H. & F. Lomax, of Platt Bridge.

COMPETITIONS.

THE PALACE OF PEACE.—The Foreign Office has received a communication from His Majesty's Consul at Amsterdam (Mr. W. C. Robinson) stating that the programme for the international architectural competition for the Palace of Peace in the Hague has been issued. The amount appropriated for the building is 1,600,000fl., or about 130,000*l*. Designs are to be handed in within seven months. Details will be supplied, on application, by Mr. D. E. C. Knuttel, architect, Fluweelen Burgwal, The Hague.

COUNCIL SCHOOLS, BOLSOVER.—In the recent competition (limited to architects in the geographical county of Derby) for three Council Schools at Bolsover for the Derbyshire Education Committee, the first place for the Stanfree School was secured by Mr. Clarence R. Ross, of York Chambers, Long Eaton; while for Langwith Bassett and New Bolsover the successful architect was Mr. H. Tatham Sudbury, of Lord Haddon-road, Ilkeston, and these gentlemen have been engaged by the Committee to carry out the work.

Books.

An Introduction to the Design of Beams, Girders, and Columns in Machines and Structures, with Examples in Graphic Statics. By WILLIAM H. ATHERTON, M.Sc. London: Charles Griffin & Co., Ltd. 1905.

MUCH has been written on the theory and practice of beam design, and, notwithstanding the fact that the subject is by no means of abstruse character, it must be admitted that several essential points which ought to be made perfectly clear are not invariably discussed to the complete enlightenment of the inquiring mind, owing to the stereotyped methods adopted in many treatises. In the present book we are glad to find that Mr. Atherton has gone to the root of several matters that are touched upon but lightly in some other works, and that, prompted by personal knowledge of the difficulties occurring to students and draughtsmen, he has relied upon fully worked examples rather than upon general statements for the purpose of imparting clearness of view as to first principles and their application to actual practice.

Although thorough in treatment so far as it goes, this treatise is strictly introductory in scope, and, with the exception of a short chapter on "The Strength of Columns," the subject-matter is restricted to the design of beams, without any attempt to deal with the design of complete structures, except so far as these are represented by braced girders and trusses. The result is a very useful and satisfactory manual, which, we believe, will find general favour from engineering and architectural students. Among the introductory chapters which are inevitable in a work of this class, we notice a very simple explanation of the nature of couples and of their bearing upon the strength of beams. The difference between "stress" and "strain" is clearly and very properly emphasised, and the relation between these two, which may be regarded as cause and effect, is investigated to a sufficient extent. In Chapter V., on the "Strength of Rectangular Beams," the much-debated question of the position of the neutral axis of a beam section is discussed at some length. Mathematicians insist that the neutral axis must pass through the centre of gravity of the section, and therefore that its position must be determined by geometrical means alone. The theory can only be true on the assumption that the modulus of elasticity of the material is the same for compression as for tension, or that $E_c = E_t$, at the stress intensity actually involved. Ordinary beam theories and their resulting formulæ are based on the assumption that the neutral axis passes through the centre of gravity of the section under all circumstances. If we understand him aright, Mr. Atherton does not recognise the reasonableness of this treatment, although owing to the deficiency of experimental data he does not feel justified in recommending any departure therefrom. It is well-known that the ratio of the coefficients for compression and tension varies with the stress intensity, and it is strictly logical to suppose that the position of the neutral axis must vary also with the stress. Therefore the idea of a fixed position seems to be wrong, and in the case of a material where the value of E_c is, say, double that of E_t, it is difficult to justify the usual assumption that the surplus strength of the top half of a rectangular beam is of no use whatever. A more probable hypothesis is that nature, refusing to be hampered by human theories, so adjusts the position of the neutral axis that the compressive and tensile resistance of the material shall be exercised to the best advantage. While the author decides to follow the usual method of dealing with beams, his discussion of the point here mentioned is distinctly suggestive.

Near the end of Chapter VI., which contains a number of worked examples, attention is called to the discrepancy between the actual and calculated strength of a rectangular beam. The author accounts for the greater breaking load by the theory that the plastic yielding of material more remote from the neutral axis throws a higher stress on the material near to that axis, and so tends to equalise the stress over the section. This explanation seems quite reasonable, but it is probable that lateral action between the different fibres has also an equalising effect, and, further, in the case of beams composed of materials in which the ultimate tensile and compressive strengths differ materially, it is reasonable to assume that shifting of the neutral axis with increase of load has a considerable influence, as suggested above.

Chapters VII. to XII. constitute a connected series, dealing with the strength of non-rectangular beams, shearing forces, bending moments, the strength of rolled joists, the moment of inertia, and numerical applications, and do not need detailed comment. In Chapter XIV. the stiffness of beams is considered, this being a most essential feature in architectural construction. "Some Types of Girders" and "Braced Girders" form the subjects of Chapters XV. and XVI., and the concluding chapter is devoted to "The Strength of Columns." This is the only unsatisfactory chapter in the entire book. The formulæ recommended for adoption are certainly not wisely chosen, and the chapter is too short for the adequate discussion of so important a subject. This chapter suffers considerably by comparison with other parts of the work, where the treatment is very complete, and the details are worked out thoughtfully and with minute care.

Calcareous Cements: Their Nature, Manufacture, and Uses, with Some Observations upon Cement Testing. By GILBERT R. REDGRAVE, A.M.Inst.C.E., and CHARLES SPACKMAN, F.C.S. Second and revised edition. London: Charles Griffin & Co., Ltd. 1905.

OWING to the radical changes made in methods of manufacture during recent years, and notably by the introduction of the rotary kiln and the tube-mill, nearly all plant of the kind which was in general use by makers of Portland cement ten years ago has become practically obsolete. Hence a good deal of the descriptive matter contained in the first edition of this useful manual has ceased to be of practical value, and is only interesting from the historical point of view. For these reasons, the appearance of the present edition is most opportune. The authors have found it necessary to re-write several chapters so as to deal adequately with latter-day manufacturing practice, and also to place on record the results of recent investigation by British and foreign experimentalists into the chemistry of cement reactions. The first four chapters are largely retrospective, but make clear some essential conditions that ought to be duly appreciated by all who have to deal with calcareous cements. The next three chapters are of far greater practical importance, as they deal with the composition of Portland cement, analyses of raw materials, Portland cement and lime, the calculation of proportions, and rapid method of making determinations. In Chapters VIII. and IX. the treatment of raw materials by the wet and dry processes is discussed at length, the former being more suitable for the materials obtainable in the London district, and the latter for those yielded by the lias formation. It may further be mentioned that the dry process has attained its most extensive development in the United States, where cement is very largely produced from limestone occurring in the Lehigh Valley, Pennsylvania. These chapters contain accounts and illustrations of the machinery and appliances employed in different parts of the world, and it should be noted that the tube-mill is growing in favour for wet grinding, being already used for this purpose in several American and Continental works where the wet process is employed. The application of the rotary drier is another modern innovation, this apparatus being somewhat like the rotary kiln, inasmuch as it consists of an inclined slowly-rotating cylinder, from 30 ft. to 40 ft. in length, and from 4 ft. to 5 ft. in diameter, in which the material is dried by the products of combustion and heated air from a furnace placed at the lower end. The rotary drier is frequently employed in connexion with the treatment of slurry in the wet process, and for drying the raw materials in the dry process. Various modifications of the procedure adopted in different countries are described in these two chapters, to which the reader is referred for full particulars. Passing on to Chapter X., on crushing, grinding, and other machinery for the dry method, we must express regret that the authors should have thought it appropriate in a scientific work to include so many blocks evidently lent by manufacturing firms. Most of these blocks present the maker's name in prominent type, and some of them are far too large for the pages on which they are printed. The proper place for illustrations of this kind is in the advertisement pages and not in the body of the book. Moreover, no useful purpose is served, from the standpoint of the reader, by the inclusion of mere pictures. Apart from this criticism the only fault to be found with the kind of treatment adopted in this chapter is that when prominence is given to selected examples of certain types of machinery, injustice is inadvertently done to the makers of similar, and very often of equally meritorious, appliances. Writers of technical works cannot be too careful in matters of this kind, if they wish other people to believe in the absolute impartiality by which we do not for a moment doubt they are imbued.

In Chapter XI. we come to a very important subject, "The Calcination of the Cement Mixture." The chemistry of this process is an interesting study, its general objects being the expulsion of CO_2, and the production of compounds of silica, lime, and alumina, at a point nearly approaching that of fusion. The authors point out that the experiments of Fremy are relied upon to prove the existence in Portland cement of the so-called aluminate of lime, and to controvert the theory that the alumina continues in combination with silica in the form of a double silicate of lime and alumina. If the accuracy of his investigations be admitted, it must be evident that we must give up those theories of cement action which depend for their explanation on the behaviour of compounds of lime and silica. Subsequent experiments by M. Fremy led him to regard Portland cement as a highly complex body, comprising aluminates of lime formed at extreme temperatures and notable proportions of puzzuolana-like substances, all capable of becoming indurated in the presence of lime after treatment with water. The authors quote the conclusion of M. Landrin, another patient observer, that in an earthy salt with the formula 5 CaO, 3 SiO_2, we have the basis of all good Portland cements. M. le Chatelier has supplemented his earlier investigations by researches conducted with the aid of the polariscope, and has identified various substances, built up by synthetical methods, with the compounds found in cement clinker. In microscopical investigations upon the setting process, M. le Chatelier discovered that the addition of water leads to the formation of several different compounds, the most important of which was a crystalline substance, probably a derivative of the calcium or the silicate. In quick-setting cements there is a copious formation of crystals which shrink greatly when exposed to dry air, break up into fragments if heated in water to 50 deg. Centigrade, and become partly decomposed in salt water. The last-mentioned phenomenon suggests that the disruption of these crystals may account for the injurious action of sea water upon Portland cement concrete. Reference is made also to the experiments of the Messrs. Newberry, who arrived at the conclusion that the essential constituents of Portland cement are tri-calcium aluminate. This composition may be expressed by the formula X (3CaO, SiO_2) + Y (2CaO, Al_2O_3), leading to the result that "the correct proportion of lime by weight in Portland cement is 2·8 times the silica + 1·1 times the alumina. Other conclusions drawn by Messrs. Newberry are

also quoted. But neither these nor the other theories mentioned indicate that a final solution of the various problems presented by the chemical aspect of Portland cement is within measurable distance.

Turning to the practical processes of calcination, the authors give an excellent account of several types of kilns and drying chambers usefully and appropriately illustrated. In Chapter XII. they describe some types of the rotary kiln, and give four illustrations of the Lathbury-Spackman kiln. Near the end of this chapter it is said that "Messrs. Lathbury & Spackman, of Philadelphia, have allowed us to reproduce four illustrations explanatory of their rotary kiln system." The reader may conjecture that this gracious permission has been influenced by the fact that one of the joint authors bears the name of Spackman. Such a surmise may be right or wrong, but we think it would have looked better if the authors had included illustrations of other rotary kilns in this chapter. A very successful type is used in the cement works by Messrs. Martin Earle & Co., of Rochester, and manufactured in the engineering works of the same firm. Surely this deserved mention equally with the American apparatus to which the authors have devoted so much attention. After short chapters on "Grinding, Storing, and Packing Cement" and "The Composition of Mortar and Concrete," the subject of cement testing is treated at some length, and in an entirely satisfactory manner. Then follow some notes on the employment of slag in cement manufacture, and on various special forms of cement, including those of the plaster variety. In the final chapter various specifications for Portland cement are set forth, but as the Engineering Standards Committee have now issued the British Standard Specification, the information in this chapter is only useful for the purpose of comparison.

The volume is concluded by a series of appendices, containing matter of general interest, and, considered generally, may fairly be described as a thoroughly reliable manual on those aspects of the cement industry which have been selected by the authors for description and discussion.

Gas Engines and Producer-Gas Plants. By R. E. MATHOT, M.E., Member of the Société des Ingénieurs Civils de France. Translated by Waldemar B. Kaempffert, with a Preface by Dugald Clerk, M.Inst.C.E., F.C.S. London: Crosby Lockwood & Son. 1905.

A WELCOME addition to the literature of gas engines is made by the appearance of this treatise from the pen of an engineer, who, as Mr. Dugald Clerk justly remarks, possesses special qualifications for dealing with gas engines and auxiliary plant. Internal-explosion motors certainly require much greater care on the part of attendants than do steam engines. Machines of the latter type are continuously subjected to comparatively low pressures and temperatures, and those of the former are intermittently exposed to high pressures and temperatures. These conditions are trying, and, in addition to the necessity for adopting artificial means of cooling the cylinder, the user must pay careful attention to numerous details if efficiency and economy are to be secured and maintained. The object of this manual is to state the elementary precautions for observance and to set forth the manner in which repairs should be executed, engines of moderate power being particularly considered.

In the present day gas engines are produced at lower prices and in greatly-improved types, so that they are capable of being applied to purposes for which they were formerly unsuited, while the introduction of producer-gas, and recent improvements in suction gas-producers, have placed at the disposal of engine users extremely cheap forms of fuel. But even if ordinary illuminating gas be employed, the internal-combustion motor compares favourably with the steam engine. The author is probably not far wrong in stating that the cost of installing a 15 to 20-h.p. steam engine is approximately 45 per cent. more than that of a gas engine of equal power, and that the cost of running is something like 23 per cent. more, if all charges be taken into account.

An illustration on page 18 showing the relative floor areas required for a 30-h.p. gas engine, with a suction gas-producer, should appeal very directly to architects as an argument in favour of the latter type of power installation.

"The Selection of an Engine" is discussed in Chapter II., and in such a manner that even those previously ignorant of the essential points will find no difficulty in arriving at a satisfactory conclusion.

The installation of gas engines is considered in three chapters. The first of these, Chapter III., bears the title, "The Installation of a Gas Engine," and deals with the fixing of such essentials as gas pipes, meters, pressure regulators, air pipes, and exhaust pipes. Chapter IV., entitled "Foundation and Exhaust," is a contribution of much interest, for, in addition to illustrating foundations suitable for industrial installations, it includes an instructive discussion of the best methods for preventing the transmission of vibration from the moving parts of the engine to the foundation, and for obviating the air vibration caused by the action of the piston.

In Chapter V. will be found several useful diagrams showing correct and incorrect arrangements of tanks and pipes. Taken together, these three chapters constitute an admirable set of directions for the proper installation of a gas engine, and we are pleased to bear witness to the very thorough and able manner in which the author has discharged this part of his task.

Some characteristic features of "Producer-Gas Engines" are set forth in Chapter X., and in Chapters XII. and XIII. M. Mathot gives a complete description of apparatus for the generation and purification of producer-gas by the pressure and suction methods, and supplements this information by fully-detailed directions for the management of the plant and of the engine in which the gas is used.

Although not mentioned in the title-page of the treatise, "Oil and Volatile Hydrocarbon Engines" are accorded a few pages, after which the author concludes by a second chapter on "The Selection of an Engine."

In conclusion, we desire to acknowledge the conspicuous ability and care displayed so prominently throughout this treatise, which deserves to be accepted as a standard work on the subjects to which it is devoted.

Gas and Oil Engines Simply Explained: An Elementary Instruction Book for Amateurs and Engine Attendants. By WALTER C. RUNCIMAN. Fully Illustrated. London: Percival Marshall & Co.

AS AN elementary explanation of the *rationale* of the internal-combustion engine this little book should be acceptable to many users of small gas and oil engines. The author describes the main features characterising the design of such machines, and explains, so far as space permits, the principles and essentials of satisfactory running. The book is well illustrated, chiefly by reproductions of sectional drawings, and the treatment throughout is of practical character. Hence this work is one we can recommend as a useful primer on the subject.

Private House Electric Lighting. By F. H. TAYLOR, A.M.I.E.E. London: Percival Marshall & Co.

THIS book is written for those who "though not necessarily electrically trained, yet wish to gain an intelligent and accurate idea of good modern practice in the electric lighting of private houses." The author is evidently thoroughly familiar with his subject, and useful hints and warnings are given in connexion with electric wiring. We think, however, that the little technical information in this work is useless to anyone but electricians, and that too much stress is laid on the importance of the consulting engineer. As a rule, the engineers of the supply companies are always ready to give all the information an intending consumer may require, and they will not connect his installation with the supply mains until they are satisfied that it has been put up in accordance with the rules of the Institution of Electrical Engineers.

Repairs: How to Measure and Value Them. By GEORGE STEPHENSON. Fourth edition, revised and corrected. (London: B. T. Batsford, 94, High Holborn. 1905.)

THIS work is obviously the outcome of practical experience, and, as such, is especially welcome. There are few departments of builders' pricing that are carried out in a more haphazard fashion than that of repairs. This haphazard pricing is responsible for those embarrassing tenders sent in for this class of work—amazing discrepancies that make it difficult for an architect to advise a client: on the one hand having a price that he knows cannot possibly cover the cost of the work, and so will be a source of trouble the whole time the work is on hand, and dissatisfaction on all sides at completion; and on the other the difficulty of persuading a client that anything up to 50 per cent. greater expenditure will be money well laid out. With a work such as this, any builder, with the most elementary knowledge, should be able to prepare and price an estimate for any ordinary repairs. Mr. Stephenson commences with a typical specification for this class of work—one that leaves some imagination to the builder, as these specifications often do—and then takes the reader through item by item, showing him the method of measurement, and then analysing the prices of each item. If every builder who has to estimate for this class of work would follow the system herein set forth, it would be to the advantage of all concerned, client, architect, and builder. Being essentially practical in every particular, we have every confidence in recommending this work.

BOOKS RECEIVED.

AN INTERMEDIATE COURSE OF MECHANICS. By A. W. Porter, B.Sc. (London: John Murray. Price 5s.)

A PRACTICAL TREATISE UPON WARMING BUILDINGS BY HOT WATER. By Frederick Dye, M.R.I. (London: E. & F. N. Spon, Ltd.)

THE CATHEDRALS OF ENGLAND AND WALES. By T. Francis Bumpus. (London: T. Werner Laurie, Clifford's-inn.)

PRACTICAL GILDING, BRONZING, AND LAQUERING. By F. Scott-Mitchell. (London: The Trade Papers Publishing Company, Ltd., Birkbeck Bank-chambers. Price 3s.)

THE PAINTERS' POCKET-BOOK. By P. Matthews. (Manchester and London: John Heywood.)

CALENDAR OF THE GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE for 1905-1906.

BRITISH STANDARDS FOR TROLLEY GROOVE AND WIRE (Interim Report of the Engineering Standards Committee, Leslie S. Robertson, Secretary). (London: Crosby Lockwood & Son. Price 1s. net.)

BRITISH STANDARD SPECIFICATIONS AND TABLES FOR TELEGRAPH MATERIALS (Interim Report of the Engineering Standards Committee, Leslie S. Robertson, Secretary). (London: Crosby Lockwood & Son. 10s. 6d. net.)

Correspondence.

SECRET COMMISSIONS.

SIR,—I have recently heard of a case where an architect had selected some goods from a firm of manufacturers for use on a building in course of erection. The price was agreed, and the builder was instructed to order the goods, 10 per cent. being allowed to the builder for so doing.

The order in due course was sent by the builder, but with it a note that he expected a further 15 per cent., or 25 per cent. in all, but that this 15 per cent. was not to figure on the invoice, as in due course the same would come before the surveyors. The suggestion was that the 15 per cent. should be arranged by a credit note, of which the architect would not know anything.

I am told that this is the general method. The firm in question declined the order, and so the murder was out.

It seems to me absolutely dishonest, and if the subject could be discussed in your columns a little of the evil might be remedied.

C. H. B. QUENNELL.

OLD BUILDING, BROAD STREET.

SIR,—On passing through New Broad-street a few days ago, I noticed a very quaint bit of architecture, recently laid bare through the demolition of the south side of this street. I refer to the old building adjoining and used as vestry to All Hallow's Church, London-wall. In the old stone walls there are several very small windows and an ancient door, evidently the remains of a very much older edifice than the present church. It would be interesting to know to what period this old work belongs, and also the probable date of two windows on the west side, of, I should say, a much later period.

Possibly you might think this worth a corner in your esteemed paper. J. STANNAH.

COST OF WIDENING ROAD.

SIR,—I should be much obliged if any of your readers could throw any light upon the law of the following case:—

A road, admitted to be an ancient highway,

but of a less width than demanded by the by-laws in the case of new streets, is being built upon by different owners upon both sides, and plots are offered for sale for building by different owners on both sides. The local council demand that the road must be widened to the width required under their by-laws, and the cost of the work borne by the frontagers in proportion to their frontages. The council contends that decisions have been given under the Public Health Act in precisely similar conditions, in which the frontagers have been forced to pay the cost of the widening. The frontagers contend that, being an ancient highway, the cost must be borne by the council, and they are advised by various legal gentlemen that their contention will be upheld in court. Can any of your readers cite the cases which support the two diverse contentions?

ENQUIRER.

EARTHY MATTER IN SAND.

SIR,—Will you kindly oblige by letting me know, through your columns, what is the greatest percentage of dirt or earthy matter in sand that an architect or engineer will allow to be used without being washed, and also the method of calculating the same. W. S. A.

*** As some difference of opinion still exists with regard to the effect of earthy matter mixed with sand upon cement mortar and concrete, we cannot predict what any given architect or engineer might demand. Sand employed in masonry construction often contains 5 per cent., and sometimes 10 per cent., of foreign material, and, speaking generally, engineers have been in the habit of requiring the proportion to be limited to 5 per cent. Recent investigation shows that the presence of clay and loam to the extent of 15 per cent. may be beneficial to cement mortar. If, however, the mortar is to be placed immediately under water, the proportion should not exceed 8 per cent., owing to retardation of the final set. Mortar containing a moderate percentage of clay is improved in respect of plasticity and watertightness. We must qualify the foregoing by the remark that some tests of unwashed sand and loam have given entirely satisfactory results, and other tests unsatisfactory results. The reason for this is to be found in the different character of the materials described as loam and earth. Without precise information as to the nature of the foreign matter and the intended use of the mortar, which we assume our correspondent is proposing to make, we cannot give a more definite opinion. The proportion of earth in sand can readily be ascertained by shaking up a given quantity with water until the sand is clean, when the difference of weight will give an index to the proportion of foreign matter removed.—ED.

The Student's Column.

STEAM BOILERS AND PIPES.—VIII.

BOILER SETTING (*continued*).

THE cross flue of a Cornish or Lancashire boiler, giving access right and left from the bottom to the side flues, is bounded at each end by a continuation of the side walls of the brickwork, the back of the flue is formed by fire-brick lining built up in front of the bottom flue walls and of the concrete or brick filling behind these, and the front of the flue is formed by the lower portion of the front cross wall and the blow-off recess. All the inner surfaces are lined with fire-brick, and the floor is of the same material, laid on the concrete foundation bed.

The right and left hand portions of the cross flue are often made with a floor sloping up to the level of the side flues, as in Fig. 13 *ante*, with the object of facilitating the draught. This method of construction is not necessary, but tends to prevent the formation of eddies in the corners of the flue. It has the disadvantage, however, of preventing the fixing of a soot door at each end of the cross flue, by means of which flue dust can be raked into the blow-off pit for removal. Bull-nosed fire-brick should be used for finishing the top of the lining over which the gases pass on their way to the side flues.

The front cross wall of the setting is usually 9 in. thick, the inner half of fire-brick and the outer half of any suitable brick, preferably glazed or hard-pressed brick set in cement so as to guard against the infiltration of air.

We have already shown (see Figs. 13 to 15 *ante*) alternate methods of arranging the blow-off recess in the front cross wall, the sides of the recess being there shown 9 in. thick. If bricks of the ordinary shape be used for building the recess, it may frequently be desirable to make its walls only 4½ in. thick, thereby reducing the brick surface in contact with the boiler shell. As a matter of fact, this thickness is frequently considered to be quite sufficient for any size of Cornish or Lancashire boiler, as the recess has no weight to carry and is primarily intended for shielding the blow-off connexion from the hot gases. The reduced thickness makes the form of the cross flue somewhat more favourable for the passage of the furnace gases into the side flues. It should not be forgotten, however, that a 9-in. wall is better calculated to reduce the outward transmission of heat and the inward penetration of cold air through the brickwork. By using special bricks with a semi-circular section at the top, the width of bearing surface can be reduced to a mere line. If bricks of ordinary shape be used for a 9-in. recess wall, the top course should only be 4½ in. thick, so as to reduce the surface in contact with the boiler shell.

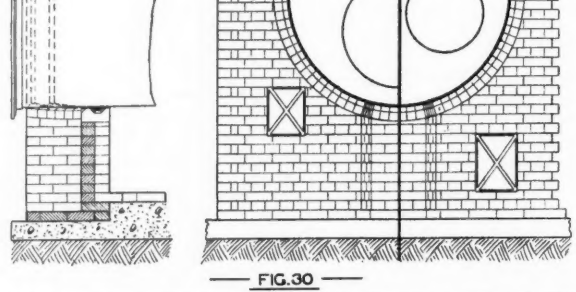
Neither the recess wall nor the front cross wall should be built up too close to the boiler shell, or expansion will afterwards have the effect of cracking the brickwork, with consequent infiltration of air. A good plan is to carry the work to about ⅜ in. of the plates, and to insert a strip of asbestos or slag wool to form an elastic cushion for taking up expansion.

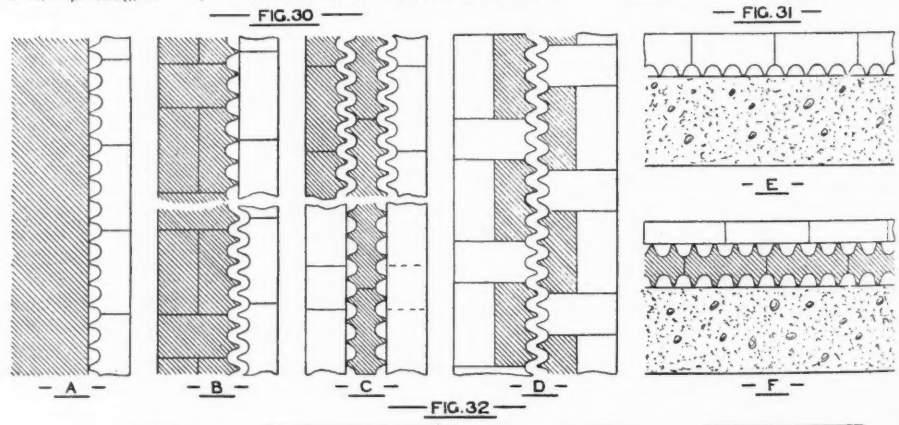
Special fireclay blocks are made for the top course of the recess wall and for the inverted arch ring of the front cross wall.

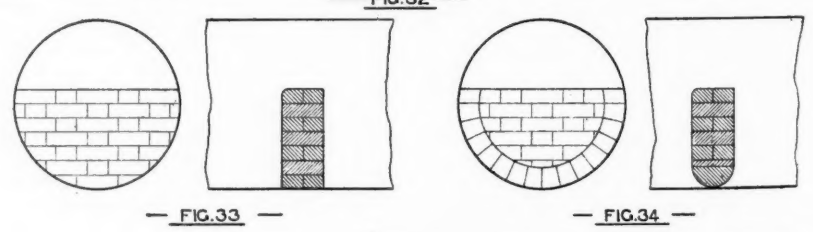
One variety, illustrated in Fig. 30, has a recess at the top for receiving a layer of slag wool or other packing material, the top surface of the block being built about ¼ in. clear of the shell, as shown. The right-hand drawing in Fig. 30 shows a front view of the blocks in position, and also represents half the front cross wall and blow-off recess for a Cornish and a Lancashire boiler, the half elevations being taken just behind the front angle ring of the boilers. The soot doors are here shown in the most convenient positions for the boilers in question.

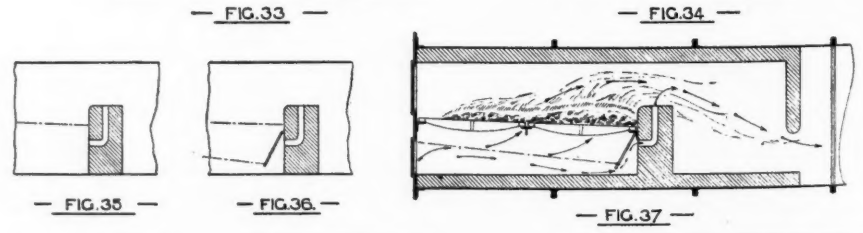
The main flue is sometimes arched over with brick, but can be covered far more expeditiously by special fireclay blocks with interlocking joints, and made in various patterns for flues of any width. Fig. 31 sufficiently illustrates the convenient manner in which blocks of this kind can be employed in the construction of a main boiler flue.

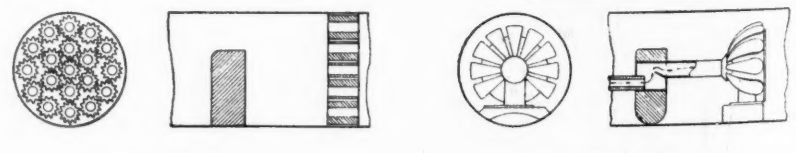
In building fireclay linings it is generally sufficient to use heaters only in the upper course. By adopting this method of construction the linings can be removed and renewed without affecting the stability of the other brickwork. Care should be taken not to use too much fireclay in laying the











Illustrations to Student's Column.

fire-brick flue linings, which ought not to have more of this material between successive courses than may be necessary for levelling the work.

As already stated, the use of hard brick and cement mortar is advisable for the outer walls of boiler seatings. Besides preventing the infiltration of air, impermeable materials are particularly suitable for building walls with internal air spaces intended to reduce the outward transmission of heat from the boiler. Porous bricks and lime mortar are of comparatively little use for hollow wall construction, owing to their inability to confine a cushion of perfectly still air as a non-conducting material.

In boiler-houses where limitations of space do not permit hollow walls to be built in the ordinary manner special bricks made for the purpose in clay and fireclay can be used with advantage.

Fig. 32 illustrates various applications of Poulton's serrated anti-radiation bricks, specially made for boiler-setting work. In these drawings the hatched bricks are of ordinary clay and the plain bricks of fireclay.

Furnace design is a matter that scarcely comes within the scope of the present chapter. A Cornish and Lancashire boiler as ordinarily supplied has a complete set of furnace fittings, the construction of which is usually in accordance with the standard practice of the boiler maker, but the setting of such fittings comes to some extent within the province of the architect.

Sometimes the firebridge consists of a cast-iron trough in which fire lumps are fitted, the trough having suitable metal supports. But the bridge is more often formed by a brick wall, built up from the bottom of the furnace tube, and in such cases the aid of the boiler-setter is required.

A firebridge built as shown in Fig. 33 has the defect that a large surface of the tube is covered by brickwork.

This fault is avoided by the construction represented in Fig. 34, where the use of fire-bricks with a semi-circular cross section reduces contact between the wall and the furnace tube to a mere line, while the arched outer ring adds to the strength of the construction.

The firebridge is occasionally built as shown in Fig. 35, which is a simple form of "split bridge," the object of this arrangement being to admit air at the back of the fire to promote secondary combustion. This drawing represents a very bad type of split bridge, permitting air to pass into the flue without regard to the requirements of the furnace. To improve the arrangement it is only necessary to add two dampers, one in front of the air passage in the bridge, as shown in Fig. 36, and the other on the boiler front, so that the regulation of air supply may be effected in a proper manner.

As the air reaching the flue behind the bridge cannot be efficiently heated during its passage beneath the fire-grate, it necessarily has a cooling effect, and the split bridge is not to be recommended unless employed in connexion with a supply of air heated by auxiliary apparatus. To discuss appliances of this kind would carry us far away from the subject now under consideration.

However excellent the design of a Cornish or Lancashire boiler furnace may be, its environment must necessarily be bad, owing to the fact that the tube is surrounded by water-cooled surfaces. Consequently, where bituminous fuel is used the temperatures of the gases evolved may be so much reduced as to interfere with the process of combustion to a serious extent. To provide against this disadvantage it has been proposed to line the furnace with fire-brick and to continue the lining so as to form a secondary combustion chamber behind the firebridge, as shown in Fig. 37. This arrangement is good theoretically, but, for reasons already stated, it would be extremely inadvisable to cover up the plates by brickwork in the manner suggested.

There are, however, other simple methods of improving the combustion in the furnaces of Cornish and Lancashire boilers to which the same objection does not apply.

Fig. 38 includes an elevation and section of the Greaves secondary bridge, which consists of a series of tubular blocks of refractory material placed behind the usual fire-bridge so that the entire products of combustion must pass through the tubes. These tubes become incandescent in a very short time, and, attaining a white heat, have the effect of completing the combustion of the furnace gases. The tubular bridge is generally used in conjunction with a split fire-bridge, provided with dampers so that the supply of air for secondary combustion can be regulated in accordance with requirements.

Fig. 39 illustrates a boiler fitted with Poulton's regenerative cones, split bridge, and hollow fire-bars, the object of this arrangement being to maintain a high mean temperature in the furnace tubes of Cornish and Lancashire boilers by securing complete combustion of the gases. The ordinary air supply is admitted in the usual way, and the secondary air supply passes through the hollow fire-bars, where it is heated, and is afterwards delivered through the split bridge and a pipe to the first regenerative cone. This cone is built up of fireclay lumps having parabolically curved surfaces, by which the stream of heated air is broken up and distributed over the whole cross section of the furnace tube. The cone is seated upon a fireclay block, which reduces the bearing surface to a minimum. Provision is made for turning the cone on its support to the right or left hand, so as to give room for boiler inspection and cleaning.

The number of cones used in a boiler depends upon the length of the flue. In a 30-ft. Lancashire boiler five cones, spaced 1 ft. 9 in. apart centre to centre, would be a suitable arrangement. As each of the nine lumps in one cone is capable of storing some 6,000 heat units, the storage capacity of five cones would be 270,000 heat units, available for absorption by the relatively cold and partly-consumed gases proceeding from the furnace when the fire has been freshly stoked. By contact with the incandescent material these gases are ignited, and secondary combustion is established, thereby maintaining a high mean temperature in the tube and obviating the emission of black smoke from the chimney.

These cones and the incandescent bridge described above can be applied to the furnaces of Cornish and Lancashire boilers in a few hours at any time when the fires have been drawn, and without involving structural alterations of any kind.

The consideration of brickwork for special and combined forms of Cornish and Lancashire boilers must be reserved for the succeeding article.

METROPOLITAN ASYLUMS BOARD.

THE recently issued annual report of this authority contains some interesting information respecting the works carried out during the year. Referring to the amalgamation of the offices of engineer and surveyor, the report states that the new arrangement has proved very successful. Both departments have now been under the supervision of Mr. Hatch for nearly two years, and during that time, the work having grown very largely, a considerable increase in the staff has been made. The total value of the cleaning and painting works carried out at the various institutions of the Board during the year amounted to 13,363*l*., of which 2,150*l*. represents the value of the work carried out by direct labour and 11,213*l*. the value of that carried out by contract. Mechanical stokers had been installed at a number of the Board's institutions, including Brook Hospital, Tooting Bec Asylum, North-Western and Western Hospitals, and Grove, Park, and the Northern Hospitals. The approximate value of the works carried out under the supervision of the engineer-in-chief during the year was 95,888*l*. Of this sum 58,238*l*. was for engineering work and repairs and 37,650*l*. for building work and repairs. Of the more important schemes which have been matured and approved by the several committees concerned during the twelve months were the planning of new workshops and the re-modelling of the school laundry at the Darenth Asylum, the provision of additional buildings at the Tooting Bec Asylum, the planning of the new Central Stores, of a new boiler-house at the Eastern Hospital, of a new boiler-house and workshops at the works of the North-Eastern Hospital, together with the preparation of schemes for engineering work at the Southern Hospital, the remodelling of hot-water supplies at the Brook Hospital, the heating of the Gore Farm (Upper) Hospital, and engineering and other works at the Belmont Asylum. The total value of these works is estimated at about 120,000*l*. The total cost on completion of the erection and fitting up of the office of the Board has been 57,290*l*. 6s. 2d., which sum included an amount of 1,664*l*. 5s. 5d. for authorised extra works. Dealing with the mode of carrying out minor works and repairs, the report mentions that some time ago attention was called to the considerable diversity of practice existing in the manner in which instructions to carry out works and repairs not exceeding 100*l*. were conveyed to the Works Committee by the other committees. The Works Committee expressed the opinion that if they were to be held responsible for the efficient and economical execution of any works or repairs it should be left to them to determine in what manner and to what extent the same should be carried out. This opinion was endorsed by the Board, who subsequently decided that, except in cases of emergency, no work involving alteration or repairs to any drains, gas or water pipes, boilers, machinery, electric light installations, etc., should be authorised until the same should have been reported upon by the engineer-in-chief, and that any work so authorised should be carried out under his supervision.

OBITUARY.

MR. WATERHOUSE.—We greatly regret to announce the death, after a long illness, of Mr. Alfred Waterhouse, F.R.I.B.A., R.A., LL.D. He died on Tuesday last at his country residence, Yattendon Court, near Newbury, where he was lord of the manor, patron of the living, and a large landowner. He was the son of the late Mr. Alfred Waterhouse, of Whiteknights, Reading, and formerly of Liverpool, where he was born on July 19, 1830, and senior member of the firm of Messrs. A. Waterhouse & Son, of No. 20, New Cavendish-street, W. Having received his earlier education at Grove House School, Tottenham, he entered upon his career as an articled pupil of R. Lane and P. B. Alley (Lane & Alley), and continued his studies in France, Italy, and Germany. He began to practise in Manchester in 1853. He was elected a Fellow of the Royal Institute of British Architects in 1861, and in 1866 a member of the Architectural Association. He served as President of the Institute, 1888-91, and during some while as member of Council, and as member, and chairman, of the Art Standing Committee. The Royal gold medal was awarded to him in 1878; on January 16 of that year he was elected Associate of the Royal Academy, and on June 4, 1885, Royal Academician. In 1867 Mr. Waterhouse won the "Grand Prix" for Architecture at the Paris Exhibition, an honour followed with that of a "Rappel" at the Exhibition of 1878; for the Paris Exhibition of 1889 he was appointed an International Juror in the section of Architecture; in 1900 he was appointed one of the Fine Arts Committee of the Royal Commission for the Paris Exhibition. He was elected a member of the Royal and Imperial Academy, Vienna, in 1869; he was an Associate of the Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique; and member of the Royal Academies of Arts at Brussels (1886), Antwerp, Berlin, and Milan; he was also Correspondant d'Académie des Beaux-Arts, Institut de France. He served as a member of the Organising Committee for the Imperial Institute, and of the Westminster Abbey Commission. In 1895 he received the honorary degree of LL.D., Victoria University.

Examples of Mr. Waterhouse's work will be found in so many parts of the kingdom that to economise space we group several of our citations under their locality or subject, instead of arranging them throughout in chronological sequence. We give, within brackets, the dates of publication in the *Builder* of views, or drawings, with plans; some of the illustrations belong to our two series "The Architecture of our Large Provincial Towns" and "Sketches of London Street Architecture," denoted by Roman numerals. As architect during many years to the Prudential Assurance Company, Mr. Waterhouse planned and designed numerous buildings for them in London and our principal provincial towns. Of those in the latter we should mention the offices at Cardiff, Leeds, Liverpool, Manchester, Nottingham (August 28, 1897, No. IX.), Newcastle-on-Tyne, Portsmouth, and Sheffield. In London the first block of the Company's head offices was built in Holborn and Brooke-street (November 9, 1878), an enlargement was made upon the site of property in the rear in Brooke and Greville streets in 1885-6, and for a further extension were acquired Furnival's Inn, and Woods's Hotel in the rear of the Inn, Ridler's Hotel, Holborn, and much house property in Leather-lane and Greville-street (September 2, 1899, and April 13, 1901). After the Company had purchased the Staple Inn property, Mr. Waterhouse carried out the reparation of the hall and of the wood-work of the gabled front in Holborn, and removed the later plastering from the half-timbered work. In 1901 he planned and designed No. 335, High Holborn and Staple Inn-buildings, with the raised footway to the terrace of the garden court of the Inn. In

Dundee (August 13, 1898, No. XVII.), Bristol, Huddersfield, Oldham, Bradford (February 19, 1898, No. XIII.), Edinburgh (September 28, 1895), Hull, Southampton, and Plymouth, 1901-2, the Company's offices are by Messrs. Waterhouse & Son. Of Mr. Waterhouse's other works most of the following are illustrated in our journal:—"Hinderton," Cheshire, for Mr. C. Bushell, of Liverpool (January 15, 1859); the New University Club-house, St. James's-street, S.W. (May 16, 1868); the Natural History Museum, South Kensington, of which the main block was opened on Easter Monday, 1881—the designs included, we understand, two north wings, as yet unbuilt (January 4, 1873; June 7, 1879, entrance hall; April 1, 1882, with details; and May 19, 1883, with entire ground floor plan); New Court in Carey and Portugal streets, W.C., for the Serle and Carey streets Improvement Company (July 6, 1878); No. 1, Old Bond-street, at the corner, east, of Piccadilly, now Scott's Limited (January 29, 1881, No. I.); St. Paul's School, Hammersmith (August 26, 1882); the City and Guilds of London Technical Institute, Kensington (January 5, 1884, elevation and ground floor plan); the National Liberal Club, Whitehall (May 9, 1885, and May 21, 1887, with seven plans); the pedestal of Mr. Hamo Thornycroft's statue of General Gordon in Trafalgar-square (October 20, 1888); the King's Weigh House Congregational Chapel, Institute, and minister's house, Thomas and Duke streets, Grosvenor-square (January 18, 1890; and August 20, 1898, the parsonage-house, No. XXVII.); the Jenner (formerly the British) Institute of Preventive Medicine, Chelsea-embankment, 1895; the University College Hospital, Gower-street, for 300 patients, begun in June, 1898, at the charges, 100,000*l.*, of the late Sir J. Blundell Maple (October 17, 1896); the Surveyors' Institution in Great George-street, S.W. (April 1, 1899); and in 1893 the re-construction and decoration of the interior of the Atlas Insurance Offices, Cheapside (by Cubitt, 1839). In Bradford: The Old Bank, an early work. Cambridge University: Gonville and Caius College, the new buildings, of Ancaster stone, begun in 1868 and comprising the east side of Gonville Court, with the buildings on the sites of Perse and Legge Buildings, and at the corner of Trinity-street and Senate House-passage (July 12, 1873); New-court, Trinity Hall, on the east side of the (old) Porter's Court, 1872-3; a block of students' rooms on the north side of Pump, since New, Court, Jesus College, 1869-70; Pembroke College: the Master's Lodge, 1871-3; the Hall, 1875-6; library and lecture-rooms, 1875-7; with "rooms" on the site of Pembroke-place, Trumpington-street, 1871-2; and the University Union, opened in October, 1866, and since enlarged and improved, with a renovation of the debating-room in 1898, after his designs. Oxford University: Balliol College, the new Hall, opened January 16, 1877; renovation of Fisher Buildings, by Henry Keene, 1769 (October 4, 1879), and the south front, including the tower, 1867-9; and the debating-room, University Union. At Bushey: the Clergy Orphan School. In Leeds: Messrs. Wm. Williams, Brown, & Co.'s Bank, Park-row, and the Royal Insurance Offices (December 19, 1896, No. III.); the Yorkshire College of Science (December 19, 1896), since extended for the cloth-workers', dyeing, and laboratory departments, after designs by him and the firm. In Liverpool: the Seamen's Orphan Institution (May 25, 1872), University College, and the Engineering Laboratories, with the Royal Infirmary (June 1, 1889, Brownlow-hill front; and September 26, 1896, No. I., a general bird's-eye view by the late H. W. Brewer), and the Thompson-Yates Physiological and Pathological Laboratories; the London and North-Western Hotel, 1871 (September 26, 1896); and the granite pedestal for Mr. Bruce-Joy's statue in St. John's-churchyard of the late Alexander Balfour. In Manchester: the Assize Courts, 1863-4, for which his designs were selected after a severe competition, this being, we believe, his first considerable architectural work (November 7, 1896, No. II.); the Town Hall, 1868-9 (May 2, 1868; September 30, 1876; and November 7, 1896); Owens College, 1873-96 (February 4, 1871, and November 7, 1896), and the adjacent Whitworth Hall in Oxford-street—his designs for the latter being carried out by his son, Mr. Paul Waterhouse, in 1901; and the Christie Library opened on June 22, 1898 (November 14, 1896); the National Provincial Bank of England (November 7, 1896); and the Refuge Assurance Company's offices. The Municipal Buildings, Reading, and all the furniture (February 3, 1877), since enlarged; re-construction of Eaton Hall for the late Duke of Westminster, with the chapel, and the Caxton memorial in the library (July 3, 1877, August 9, 1879, and December 11, 1880); the Town Hall, Hove, Sussex (April 23, 1881); St. Mary's Church, Twyford; and his sketch-plan (July 31, 1886) prepared for the guidance of the competing architects in the Birmingham Law Courts competition, for which he was assessor.

To the foregoing should be added—Girton College, near Cambridge, 1887, the Chapel (1901) in conjunction with Mr. Paul Waterhouse; the County Gaol, Manchester; the Turner Memorial Home, Liverpool; the Hotel Métropole, Brighton, 1888-9; St. Nicholas Church, Heythrop, Oxfordshire, 1878-80; Iwerne Minster House, Dorset, 1880, for Lord Wolverton; Alloa Town Hall and Public Library, 1888; St. Peter's Church, North Hagbourne, Berks, 1890, the tower added in 1898 and the interior decorated by him in 1894 and 1898; Foster's Bank, Trinity-street, Cambridge; "Villa Allerton," on the Californie Hills, Cannes, for the late John Grant Morris; additions to and improvements of the Grand Hotel, Charing-cross, including a new banquetting-room, with other rooms *en suite*, grill-room, ground-floor reception and reading rooms, and conversion of the apartments hitherto occupied by Grillion's Club, opened on December 6, 1899; and in conjunction with Mr. Morgan, Engineer to the London, Brighton, and South Coast Railway Company, extensive structural alterations of the Grosvenor Hotel, Pimlico, 1899-1900. St. Mary's Hospital, and a restoration of St. Anne's Church, Manchester, 1886-91; the administrative block and extension of the Royal Alexandra Hospital, Rhyl, 1899; the Public Offices and covered Market, Darlington, 1862; St. Bartholomew's Church, Reading, 1879, with the exception of the chancel and side-chapels recently added by Mr. G. F. Bodley, R.A.; and at Yattendon in 1882-96, partly at his own charges, a restoration of the parish church, with a new roof and spire, and the reading and coffee rooms, which he built and maintained for the parishioners, whose well-being he in many ways warmly promoted. In 1891 Mr. Waterhouse associated Mr. Paul Waterhouse with his architectural practice, under the title of Messrs. A. Waterhouse & Son. Of the principal works carried out by them at about and since that time we may mention the National Provincial Bank, Piccadilly, at the corner of Eagle-place (May 27, 1893); Girton College, addition of the dinner-hall, chapel, kitchens, rooms for twenty-five students, library, and swimming-bath, 1899-1901; additions, for the Leather Trades Department, to the Yorkshire College of Science, Leeds, 1897-8; a block for shops and offices in Melville-square, Edinburgh, 1897-8; the Medical School buildings, Liverpool University College, opened on November 12 of last year; Salford Lying-in Hospital, Manchester, begun in October, 1899; the new operation-theatres, Liverpool Royal Infirmary; a swimming-bath for the Collingwood-street Board School, Ratcliff, E. (1900); and the new wing of the Nottingham General Hospital, with three circular wards, for eighteen beds apiece, sanitary tower, out-patients' department, and laundry buildings, 1900. In January, 1900, Mr. Waterhouse was nominated to prepare competitive designs for the re-construction of the Royal Infirmary, Glasgow, the late Queen's Diamond Jubilee Fund. On March 2, 1867, and November 29, 1884, respectively, we published and described his competitive plans and designs for the Royal Courts of Justice; and for the proposed Admiralty and War Offices (first competition). Amongst the many important competitions for which Mr. Waterhouse acted as assessor are the Birmingham Law Courts, 1886 (Sir A. Webb and Mr. E. Ingress Bell *); Sheffield Town Hall and Municipal Offices, 1889 (Mr. Mountford*); Royal Halifax Infirmary, 1902 (Messrs. Worthington & Elgood *); Newcastle-on-Tyne New Infirmary, 1899 (Mr. W. L. Newcombe and Mr. H. P. Adams jointly *); Cardiff Town Hall, 1897 (Messrs. Lanchester, Stewart, & Rickards *); Fountain Fever Hospital, Tooting Graveney (Mr. A. H. Tiltman *), and Hither Green and Park Fever Hospital, Lewisham (Mr. E. T. Hall *), for the Metropolitan Asylums Board, 1894; London County Council Municipal Lodging-house, Parker-street, High Holborn, with the late Thomas Blashill (Messrs. Gibson & Russell *); Masham-Cartwright Memorial Hall, Lister Park, for Bradford Corporation, 1899 (Mr. J. W. Simpson and Mr. E. J. Milner Allen jointly *); General Hospital, Birmingham, 1892 (Mr. W. Henman*); the Bell Tower, St. Michael's Church, Coventry, with Mr. R. Norman Shaw, R.A., and the late Ewan Christian, 1891 (Messrs. Paley & Austin *); Hotel at Newcastle for the Belfast and County Down Railway Company, 1895 (Mr. J. J. Farrall, of Dublin *); Fine Art Galleries, Glasgow, 1892; Free Library (Mr. G. W. Browne *), and Municipal Buildings (Mr. Leeming *), Edinburgh, 1887; Leys School, Cambridge, 1882 (Mr. R. Curwen *); Victoria Institute, Worcester, 1891, for which he placed as first for their architectural merit the designs of Mr. Theodore Moore and Mr. W. H. White; Wolverhampton Free Library, 1898 (Mr. H. T. Hare *); City Hall, Belfast, with the City Surveyor, Mr. Bretland, 1896; Sunderland Municipal Buildings, 1886 (Mr. Brightwen Binyon *); Gloucester Municipal Buildings, 1889 (Mr. G. H. Hunt *); and the Board-room and Offices for the Mersey Docks and Harbour Board, 1900 (Messrs. Briggs & Wolstenholme, and Messrs. F. B. Hobbs and Arnold Thornely jointly *). Mr. Waterhouse was also a member of the jury to decide on the great international competition for the proposed new façade to Milan Cathedral; and, with Lord Leighton and others, of the Committee of Selection, Imperial Institute (Mr. T. E. Collcutt*).

Upon his enforced retirement, at the close of the year 1901 Mr. Waterhouse resigned the Presidentship of the Society for Checking the Abuses of Public Advertising, which in a great measure owed its foundation to his efforts; in 1903 he retired from the Royal Academy. His son took charge of the business of the firm, and carried out some works which his father was disabled from completing under his own superintendence. Mr. Waterhouse was President in 1902 of the Polytechnic School of Architecture, and Treasurer of the Artists' General Benevolent Institution; he made a liberal donation to the New Premises Fund of the Architectural Association. Mr. Waterhouse was author of the essay upon "Architects," in a volume edited by Miss Pitcairn, entitled "Unwritten Laws and Ideals of Active Careers," 1889. Of the occupations of his little leisure we may refer to that of painting; he exhibited in the Royal Academy rooms a water-colour, "A Berkshire Lane," in 1889, and in 1900 "A Cotswold Manor-house," a study in oils. His portrait, painted by Mr. W. Q. Orchardson, R.A., is in the possession of the Institute.

* First premium awarded by him.

MR. JOSEPH TONG SKINNER.—The death of Mr. Joseph Tong Skinner, builder and contractor, took place on the 15th inst., at his residence in Wright-street, Hull. Mr. Skinner, who was seventy-four years of age, was one of the first presidents of the Hull Builders' Association.

MR. J. HOWE.—The death took place, on the 21st inst., at his residence, Wilton Grange, West Hartlepool, of Mr. Joseph Howe. Mr. Howe, who was in his fifty-fifth year, was a native of Carlisle, and about a quarter of a century ago, whilst associated with the firm of Messrs. Walter Scott & Co., of Newcastle, he took a prominent part in the construction of one of the largest of the West Hartlepool docks, and the huge warehouses connected with it. Something over twenty years ago the deceased gentleman settled in West Hartlepool, then founding the firm of Messrs. Joseph Howe & Co., which has since carried out many extensive and important undertakings in all parts of the kingdom. Mr. Howe was for some years a member of the West Hartlepool Town Council.—*Newcastle Chronicle.*

GENERAL BUILDING NEWS.

CHURCH, HORWICH.—On the 5th inst., the Bishop of Salford laid the foundation-stone of Our Lady of the Rosary Church at Horwich, which is being erected to accommodate over 600 worshippers, at a cost of about 5,000*l.* The building is to be of Yorkshire stone, and the design is Early English, the architects being Messrs. Randolph & Holt, of Manchester, and the contractor Mr. Gerard, of Swinton.

MISSION CHURCH, ST. IVES.—The new mission church, erected as a memorial to the late Canon Jones, was opened by the Bishop of Truro on the 10th inst. The building consists of a nave and chancel, with a small south tower, and, as the church stands on a hill, advantage has been taken of the formation of the ground to provide vestries under the chancel and a parish room under the nave. The church is 89 ft. long, and the width of the nave 25 ft. Throughout granite has been used, and the ashlar stonework is from the Polyphant quarries, near Launceston. Accommodation is provided for 270 persons. The cost has been about 1,600*l.*, and the architect was Mr. E. Sedding, of Plymouth.

INSTITUTE AND CHURCH, BARRY.—Lord Windsor laid the memorial-stone recently of the new Seamen's Church and Institute, in connexion with the Missions to Seamen, at Barry Dock. The scheme, when completed, will comprise a church to accommodate 150, a recreation-room, officers'-room, apprentices'-room, coffee bar, billiard-room, baths, etc. About 2,000*l.* will be required to defray the cost of the portion at present in course of erection. The new institute is erected at the junction of Dock View-road and Castleland-street. The elevations are in red Ruabon brick, with terra-cotta mouldings and dressings. On the basement floor is a cellar for storage and recreation purposes, as well as a coal-house and heating-chamber. On the ground floor is a reading-room, which can be used for concerts and entertainments when necessary, and which will accommodate about 150 people. On the second floor is an officers'-room, billiard-room, and vestry. The former will be used in the meantime as a temporary chapel until the permanent one is built. A temporary stairway from this floor leads to a flat vulcanite roof over the institute, where a garden will be laid out. There is a square tower on the roof, with look-out and flagstaff. The buildings are being carried out from plans designed and prepared by Mr. C. H. Kempthorne, Barry Dock. The contractor is Mr. H. S. Rendell, Cadoxton, and the clerk of works Mr. W. Augustus, Cardiff.

* First premium awarded by him.

PRIMITIVE METHODIST CHURCH, NEW WINTON.—The ceremony of laying the top stones to the new Primitive Methodist church in New Winton recently took place. The work has been carried out by Mr. Crabb, builder, from designs by Mr. T. E. Grimes, architect, at a total cost of 1,600*l.*

CHAPEL, CAERAU.—A new chapel is being built at Caerau by the Hope English Baptist Church at a cost of about 2,000*l.* The designs are by Mr. W. Beddoe Rees, architect, Cardiff, and the contractor is Mr. Joseph Davey, Aberavon.

MEMORIAL HALL, SUNDERLAND.—The congregation of the Trinity Presbyterian Church, Toward-road, Sunderland, are having a memorial hall erected next to the church, and on the 16th inst. the stone-laying ceremony was performed. The total cost of the structure will be 2,400*l.* On the ground floor will be a parlour, and behind that a minister's vestry. The floor above will consist of a hall, accommodating 130 people, whilst the building will also contain three or four classrooms. Mr. William Milburn is the architect and Mr. R. J. Hudson the builder for the work.

MISSION HALL, HULL.—The Queen's Hall, a building which the Wesleyan Methodists of Hull have erected in Alfred Gelder-street for religious purposes, at a cost of about 33,000*l.*, will shortly be opened. The central hall has a floor space of 75 ft. by 72 ft., exclusive of the platform, and is roofed by an arch with floriated principals, the span being 46 ft. in front of the orchestra. Below the great hall there is a schoolroom 72 ft. by 56 ft. wide, as well as a series of connecting classrooms. Messrs. Gelder & Kitchen are the architects, and Mr. Bielby has carried out the contract.

WELSH PRESBYTERIAN HALL, NEWPORT.—A new central hall, to accommodate 2,000 people, is being erected for the Welsh Presbyterian Church at Newport. The building will consist of a large hall, suitable for concerts and public meetings, classrooms, and lesser halls to hold 800 persons, with entrances from Commercial and Fothergill streets. The contractor is Mr. W. A. Linton, Messrs. Habershon, Fawckner, & Co. being the architects.

FREE LIBRARY, BRIDGWATER.—On the 10th inst. the foundation-stone was laid, on a site in Blake Gardens, of the new Bridgwater Free Library. Mr. E. Godfrey Page was the architect, and Mr. Charles Bryer the builder for the work.

PUBLIC LIBRARY, WEM, SHREWSBURY.—The Morgan Public Library and Reading-room at Wem was recently opened. The building is situate in Aston-street. It has been erected by Mr. Thomas Jervis, Wem, from plans designed by Mr. Frank Shayler, Shrewsbury, at a total cost, including the site, of about 2,000*l.*

PAVILION, DUNOON, N.B.—The new pavilion in connexion with the Castle Gardens at Dunoon was recently opened by H.R.H. Princess Louise. The building is erected on the Pier-road, the front building consisting of a row of shops, with reception-rooms above, the back building being the hall, octagonal in shape. It is constructed of stone and brick, with steel roof covered with tiles. Accommodation is provided for between 3,000 and 4,000, and the whole hall is furnished with bent wood chairs. The cost is expected to reach 10,000*l.* The architect was Mr. J. Fraser, of Dunoon.

STAINED GLASS AND DECORATION.

WINDOW, S. BRIDE'S CHURCH, LIVERPOOL.—A large three-light chancel window has just been executed in stained glass at the studio of Messrs. Percy Bacon & Brothers, of London and Edinburgh, and fixed in this church. The centre light represents the Ascension, while in those on each side are S. Barnabas and S. Bride. This window is erected to the memory of the late Samuel Haw, by his wife and children.

APPOINTMENT.

NEWCASTLE-ON-TYNE.—A meeting of the special committee of Newcastle Corporation appointed to consider the reorganisation of Corporation work was held on the 18th inst. The principal business was to receive the seven candidates who had been chosen out of sixty to fill the office of city engineer, rendered vacant by the resignation of Mr. Edge. The qualifications of the candidates were considered, and questions asked of each of them, after which the committee proceeded to reduce the number from seven to three. It was agreed to recommend the City Council to appoint one of the following three for election at their ensuing meeting:—Mr. W. J. Steele, deputy city engineer, Bristol; Mr. K. T. Campbell, engineer, Huddersfield; Mr. C. R. S. Kirkpatrick, engineer, Newcastle.

SANITARY AND ENGINEERING NEWS.

BRIDGE, GARTLEY, ABERDEEN.—A new bridge has been erected over the River Bogie at Gartley, on the road leading to Kennethmont and Huntly by way of Smithston. The design adopted is a steel girder bridge of one span with a clear waterway of 30 ft. There are two side piers or abutments of masonry founded on rock at a depth of 5 ft. below the bottom of the river; the outside faces of piers and wing walls are of hammer dressed ashlar, and the parapet walls are ashlar. The whole of the stones with the exception of the granite girder blocks are from Auchindoir quarries. The roadway has a total width of 16 ft. between the steel lattice parapets, and it is carried on cambered steel trough flooring resting on two plate girders, the troughs being filled with Portland cement concrete, on the top of which 4-in. granite cubes are set and run in with asphalte. The bridge has been designed for a uniformly distributed live load of 112 lbs. per sq. ft. The girders and trough flooring are all of mild steel made by the Siemens Martin process. The accesses at both ends of the bridge have been straightened and the gradients improved. The contractor was Mr. John M'Connachie, Huntly; the sub-contractors being Mr. Cormack, Huntly, for mason work, and Messrs. Somervail & Co., bridge builders, Dalmuir, Glasgow, for the steel and ironwork. The plans for the structure were prepared by Mr. James Barron, M.Inst.C.E.

PROPOSED WIDENING OF UNION BRIDGE, ABERDEEN.—Mr. William Dyack, the Burgh Surveyor of Aberdeen, as the result of his consultation with Sir Benjamin Baker, has now submitted a report to the Improvements Committee of the Aberdeen Town Council in reference to the widening of the Union Bridge.

SWING BRIDGE, TROWSE, NORWICH.—The new double-line swing bridge over the river Wensum at Trowse was, on the 14th inst., opened for railway traffic. Of the balanced cantilever type, the structure is 122 ft. over all, with the two opening spans of 44 ft. clear, and two viaduct spans of 23 ft. 6 in. It will be worked by electrical motor, geared up to the rack for turning the bridge, and one geared up to a set of hydraulic pumps for working the jacks which lift the bridge ends. Mr. J. A. Radley, district engineer to the Great Eastern Railway Company, had the general superintendence of the work, and the contractors were Messrs. Handyside, of Derby.

PROPOSED BRIDGE REBUILDING, BATH.—A special meeting of the Bath Surveying Committee was held at the Bath Guildhall, on the 18th inst., for the purpose of considering a proposal to re-erect the old Midland Bridge, which has been replaced by a new structure over the river leading to the destructor works, and to connect the two properties of the Corporation on either side of the river. The surveyor submitted a detailed report, in which he stated that the approximate cost of the work would be about 2,000*l.*, including abutments and approaches. He recommended the committee to acquire the bridge. An amendment was moved to the effect that the report be adopted, and this was carried by thirteen votes to three.

FOREIGN.

FRANCE.—The Société Nationale des Architectes Français has opened its twelfth annual competition. The subject is "Offices for a Daily Paper."——The "Union Internationale des Beaux-Arts" has organised an interesting exhibition at Angers, under the direction of a committee of artists, among whom Rodin is included.——M. Moncel has completed the model for a statue of Général Dumas, to be erected in the Place Malesherbes, between the monument of Alexandre Dumas *père* (by Gustave Doré) and that of Dumas *fils*, which M. de Saint-Marceaux has nearly completed.——A competition is to be opened at Lyons for a block of artisans' dwellings.——The Prefecture at Quimper is to be rebuilt, at a cost of 555,000 francs.——The municipality of Grenoble has opened two competitions, one for the rebuilding of the Ecole Vaucanson, and the other for a scientific laboratory in the Jardin des Plantes.——By a decree of the President of the Republic a district school of architecture has been opened at Marseilles.——A new bridge is to be built over the Rance, on the model of that intended for the Paris Metropolitan Railway near the Pont d'Austerlitz. M. Harel de la Noë is the engineer. The cost is estimated at half a million francs, and the bridge is to be completed in 1907.——The new municipal museum at Gray has just been opened.——The death is announced at Cherbourg, at the age of 84, of the sculptor and archæologist Le Véel, a pupil of Rude. He was curator of the Cherbourg Museum, and author of the equestrian statue of Napoléon by the margin of the sea. He had made a very fine collection of ancient faïences, which the Government purchased, a few years ago, for the Cluny Museum.

SOUTH AFRICA.—Forty-six sets of designs were received by the Southern Life Assurance Co. in response to an advertisement for competitive plans for their new chief offices in Capetown, the successful competitors being (1) Mr. John Lyon, (2) Mr. George Ransome, and (3) Messrs. Hawe & McKinlay, all of Capetown.——Mr. B. W. Eastwood's tender for the erection of the new town hall for Kroonstad is 10,827*l.* 11s. 3d. The time limit for building the hall is ten months.——At a meeting of the Pietersburg Municipal Council the town engineer reported that in the construction of Asiatic buildings locally not one structure had been so far erected without his having to request the builders to pull down defective parts and to substitute important matters omitted, so as to have same in conformity with the plans and specifications passed by the council. It was resolved that a by-law be framed with a penalty for infringement of the plans and specifications passed.——"The local building trade continues active," reports "S. A. Mines," of Johannesburg. "Plans of buildings estimated to cost 690,402*l.* were approved by the municipality last quarter (April-June). For the first half of this year buildings estimated to cost 1,313,967*l.* were approved. Thus, on the half-yearly figures, new buildings are being proposed at the rate of 2,627,934*l.* per annum, which figure compares with 2,057,229*l.* in respect of 1904. The improvement thus shown is considerable, and it is still greater if we compare the figure of the last half year (1,313,967*l.*) with that of the first half of 1904 (871,708*l.*)."

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. F. R. Farrow's telephone number has been altered to 2,328 Holborn.——Mr. Noel Barwell has removed to 14, Stafford-mansions, Buckingham Gate, S.W.——Mr. W. L. Griffiths has removed his offices from Oswaldestre House, Norfolk-street, Strand, to Oakley House, Bloomsbury-street, London, W.C.

THE PROTECTION OF IRONWORK.—Considerable attention has been devoted by American engineers to the question of protecting iron and steel work from the effects of atmospheric action, and especially from the corrosive influence of the fumes given out by locomotives. In a previous issue* we gave some of the results obtained from an exhaustive series of tests conducted by the Bureau of Surveys of the Public Works Department of Philadelphia. It was then found that red lead and linseed oil appeared to afford as much protection as any other form of paint. Within the last few weeks Mr. Louis H. Barker read a paper, before the American Society for Testing Materials, giving some interesting notes relative to the use of paraffin paper and paint as a protective covering for steelwork at the New Jersey terminus of the Pennsylvania Railroad. More than ten years ago an investigation was commenced into the merits of numerous paints with the object of determining by exposure tests the most reliable material for resisting the mixture of sulphurous gases and steam affecting the steel work of the station mentioned. Fully fifty preparations have been tried, among them being various forms of asphaltum, indiarubber, graphite, carbon lead and iron oxide paints. A noteworthy point is that even with three coats, not one of the paints used could preserve the metal from rust for more than twelve months. Recognising the facts that rust cannot form in the absence of moisture, and that no paint is impervious to moisture, the conclusion was drawn that the surface of the metal must be sealed by some impenetrable substance. After many experiments it was found that a cheap form of paraffin paper best complied with the required condition. Preliminary tests were made on bars of steel, and afterwards a number of eye-bars, supporting a floor over salt water, were treated in the same way. Notwithstanding the fact that these bars were exposed to constant damp and sewer gases, they remained for more than a year without the least evidence of rust. The experiments seem to demonstrate the fact that, in the case of smoke and gases, corrosion commences behind the paint and not from the front after the disintegration of the material. Although the permanent value of paraffin paper is not definitely determined, there is reason to believe that it should prove a most useful aid to all who have to adopt measures for the preservation of iron and steel work. When applying the paper all rust is carefully removed from the metal, a sticky kind of paint is then applied, upon which the paper is pressed with overlapping joints. It is then ready for the outer covering of ordinary paint. In connexion with this subject, we may mention a useful result recently obtained in another way at Cannon-street station. During the forty years that have elapsed since this structure was built the wrought-iron roof has suffered much from corrosion and the glazed covering has required frequent washing. The ironwork at the south end of the station was in particularly bad condition, owing to the quantities of steam and sulphurous gases given off by locomotives in getting up speed. In damp and foggy weather these vapours were found to hang about for some time, hugging the back of the vertical glazed screen at the outer end of the station. Additional ventilation has been effected by installing twelve 30-in. Boyle's "Air-pump" ventilators, the result being that the atmosphere is much clearer, and that the inside of the glazing requires no cleansing. It follows naturally that the destructive action of the fumes should be greatly reduced with a correspondingly longer duration of the paint.

* The *Builder*, Vol. lxxvii., p. 482.

THE LEEDS MEMORIAL OF QUEEN VICTORIA.—The Queen Victoria Memorial, which is to adorn Victoria-square, in front of the Town Hall, will occupy the site of the old fountain. Mr. G. J. Frampton, R.A., from whose designs the memorial is being constructed, expects that it will be ready by the end of October.

WATERWORKS EXTENSION, SWANSEA.—The Swansea Waterworks are now being extended for the Corporation, under the direction of the engineer, Mr. R. H. Wyrill, C.E. The Columbian Fireproofing Co., Ltd., of London, E.C., is carrying out the contract for the supply of over a mile of armoured cement pipes, to be laid in connexion with the extension.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—Returns received from sixty-two Employers' Associations show that employment was dull in most districts and worse than a year ago. Employment with carpenters continued dull, but showed a slight improvement. It was worse than a year ago. The percentage of unemployed trade union carpenters and joiners was 6·5 at the end of July, as compared with 6·7 in June and 5·7 a year ago. With plumbers employment on the whole was much the same as a month ago. In England it was bad; in Scotland moderate. The percentage of unemployed trade union plumbers was 10·1 at the end of July, as compared with 10·2 at the end of June, and 10·5 a year ago. With bricklayers, masons, and plasterers employment generally was dull and worse than a year ago. With slaters it was much the same as a month ago, being bad in England, but fairly good in Scotland. It was worse than a year ago in England, but rather better in Scotland. Employment with painters was slack and worse than a year ago. With builders' labourers it was dull on the whole.—*Labour Gazette.*

GLASGOW JOINERS' DISPUTE.—The second conference arranged by the Lord Provost, Sir John Ure Primrose, Bart., between the master wrights of Glasgow and district and representatives of the joiners took place, on the 16th inst., in the City Chambers, Glasgow. The question at issue was the proposal to reduce the men's wages from 10d. to 9d. per hour, the men having refused to compromise by accepting 9½d. Both sides were practically agreed as to the date of signing by-laws being July 1 instead of April 15. After a long conference the men's representatives offered to resume work on the new July by-laws at 9½d. per hour, conditional to the executive agreeing to this. The masters' delegates decided, in the event of the men's executive confirming this offer, to call a special meeting of the trade for the purpose of considering the compromise. The men held a mass meeting in the Waterloo-rooms in the evening of the same day to discuss the proposed settlement. The report of the representatives who had attended the afternoon conference was delivered and adopted; but the meeting, by a large majority, rejected the proposed terms. Furthermore, it was stated that the executive, in view of the general feeling in regard to the masters' evident reluctance to accept the proposed compromise, or to propose any compromise on their own part, declared that they would withdraw all past concessions made to the employers. They have also resolved to have no further communication on their own initiative with the employers.—At a meeting of the Strike Committee of the Glasgow Master Wrights' Association, held on the 21st inst., in the Building Trades Exchange, it was agreed to call a general meeting of the trade, when the men's offer to resume work at 9½d. per hour, the agreement to date from July 1, will be fully considered.

BRICKLAYERS' STRIKE, NEWCASTLE.—At a conference of representatives of the Building Trade Employers' Association and of the Operative Bricklayers' Society, held on the 22nd inst., in the Town Hall, Newcastle, it was agreed that the wages to be paid to the bricklayers in the district covered by the conference shall be 9½d. per hour; that the rule previously existing as to piecework be and is hereby maintained; that the rule previously existing as to the number of apprentices be and is hereby cancelled; that, pending the adoption throughout the district covered by the Northern Centre of the National Federation of Building Trades Employers of the closer union scheme of settling disputes in the building trade, the following shall be the rule for dealing with such disputes in the districts represented at this conference, namely:—All trade disputes shall be settled by a committee composed of twelve delegates, an equal number from the employers and Operative Bricklayers' Society, who, failing to agree, shall call in a disinterested gentleman of known integrity, who shall have a casting vote, such committee to meet at least three months before the expiration of the notice for alteration of rules, or within forty-eight hours of any minor dispute occurring. The strike is now, therefore, at an end, and work will be commenced immediately.

Legal.

REMOVAL OF SHINGLE FROM THE SEASHORE.

THE summons against an employé of the Shanklin Urban District Council (Robert Spencer), which has been repeatedly adjourned at the request of the Board of Trade, for a breach of the Order recently made by the Board of Trade prohibiting the removal of shingle from the seashore at Shanklin, came on again for hearing at the Isle of Wight County Petty Sessions, before Admiral Sir Algernon de Horsey (Chairman) and other magistrates, at the Newport Guildhall on Saturday last, and the case was then disposed of. Mr. H. Eldridge Stratton was the solicitor for the police, who prosecuted. Mr. John Marsh (clerk to the Shanklin District Council) defended, and Mr. A. T. Ivens watched the case on behalf of an interested person, Mrs. White Popham, the lady of the manor, who is a foreshore owner. Mr. Stratton, at the outset, said it was a simple question of whether the Order which the Board of Trade had seen fit to make had been contravened, and the Bench had not to go into any question of right or title in regard to the foreshore. The justices' clerk (Mr. John Fardell) said the Bench could test the reasonableness of the right of the Board of Trade to make the Order. It did not follow that because the Order was made that it was good. If it was a bad Order, it could not be enforced.

Police Sergeant Hutchin stated that on April 26 he saw the defendant removing shingle from the beach at Shanklin, contrary to the provisions of the Board of Trade Order. When he spoke to defendant about it he told him the shingle was being used for making concrete blocks to repair the sea wall, and defendant also said he was carrying out the instructions of the Shanklin District Council.

Mr. Marsh submitted for the defence that the Board of Trade Order had no force against the Shanklin District Council, who were legally empowered under a lease of the shore, which they held from the lady of the manor of Shanklin (Mrs. White Popham), to take shingle and other shore material for the purpose of sea defence works there, and to sell to builders in the district. Since the Order was made the District Council had decided not to sell any more shore material, but they submitted that, whilst the liability was still imposed upon them to maintain the sea wall, etc., it would be manifestly unjust to deprive them of the right, the exercise of which enabled them to discharge that liability.

The justices' clerk said the limits of the port were defined for fiscal and customs purposes to include the whole sea coast of the Isle of Wight, and they had to accept that. He agreed with Mr. Marsh that the Order was not good as against lords of manors. The Board of Trade inspector who held the inquiry with regard to the making of the Order was a naval officer, who did not go into the legal question.

The Bench upheld Mr. Marsh's contention that, in view of the section of the Act reserving the rights of corporate bodies, lords of manors, etc., the Order had no force against the Shanklin District Council, and the case was dismissed.

PATENTS OF THE WEEK.*

APPLICATIONS PUBLISHED.

18,304 of 1904.—A. E. BLIZZARD and H. TODD: *Construction of Dies for Use in Making Slab Tiles, and other Articles, with Undercut Grooves or Serratures in same.*

The construction of metallic die blocks for use in making square, rectangular, hexagonal, and other shaped slabs, tiles, and like earthenware articles, with straight radial undercuts in same within two or more circular lines, the angle of the several undercuts being the same, in the same direction, or at the same angle in the same direction within two or more rows of circular lines, and at the same angle in the opposite direction in the other row or rows of circular lines, and the mechanism in such die blocks and their die box, for imparting a twist or segmental motion to all of the discs on the upper end of such blocks at the same time, for releasing their serrations from the undercuts, formed in a pressed article as it is forced or pushed by the die block to the upper end of its die box.

18,314 of 1904.—R. BREFIT and W. BREFIT: *Window Frames and Sashes.*

This relates to a window the sashes of which balance and are supported by chains or the like attached to each sash and passing over pulleys carried by the frame, and consists in constructing the sill of such a height and the bottom rail of such a width that when the top sash is lowered a pre-arranged width for the purpose of ventilation there shall be no open space between the bottom rail and the sill.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

20,646 of 1904.—J. SHANKS: *Water Supply Cisterns for Water-Closets and the like.*

A water supply cistern having an inverted U-shaped syphonic discharge pipe, a chamber within the cistern communicating with the down leg of the discharge pipe, and a ball float in the cistern operating a valve controlling the supply of water to cistern and chamber.

21,883A of 1904.—R. W. H. RODNEY: *Friction Roller Apparatus for Sliding Doors.*

A friction roller consisting of a barrel or casing, and having arranged therein a coiled spring, and over this spring is mounted a ball in a cup or socket-piece in such a manner that the ball is capable of being pressed into the casing against the action of the spring. In a modification of this device a wheel is employed in place of the ball. This is mounted on a spindle, which works up and down in slots in a slotted tube against the action of a coiled spring. The bottom of the tube is solid, to form a bearing for one end of the spring, whilst to form a bearing for the other end of the spring a forked bracket is employed, the lower end against which the spring bears being solid, and the forks pass on either side of the wheel, and have holes drilled in their ends to receive the spindle of the wheel.

22,233 of 1904.—A. BROOKS: *Cranes and the like.*

This invention relates to cranes and the like, and consists in constructing the arms or rim of the spur wheel, secured to or mounted on the barrel shaft, or the intermediate wheels or gearing disposed between the barrel shaft and the winding or lowering handle or handles, with suitable square or polygonal holes to receive a handle to operate the said gearing in lieu of the ordinary winding or lowering handle or handles, which will effect a great saving in time.

25,815 of 1904.—A. G. LUCAS: *Roofing Tile Cutter.*

This invention consists in the cutting blades being fixed to a casting of iron by set screws, the said casting working up and down a slide by means of a lever pivotted to an upright in such a manner that the leverage thus obtained makes the work of cutting the roofing tiles easy.

5,671 of 1905.—G. C. MARKS (A. H. DIVER): *Fireproof Doors.*

A fireproof door wherein the frame is constructed of plies of material, one or more of which are fire resisting; such plies are glued together, thus forming the panels of a door in a similar manner, and said plies are also connected to the said door by means of rabbets in the door frame, such rabbets being lined with fire-resisting material.

5,869 of 1905.—F. G. HICKS and J. BICKHAM: *Construction of Roofing and Ceilings for Houses.*

A roof for building consisting of ridge piece, principals, rafters, tie beams, and wall plates assembled, and braced together away from the building and adapted to be lifted and placed bodily in situation on the building, said roof being adapted to be supported when in position by resting on the end walls only, a ceiling formed in one with said roof, consisting of bars of inverted T section, extending across the span of the roof from wall plate to wall plate, and slabs supported by the flanges of said bars, a chute for conveying the rain water, consisting of a wide sheet of metal, one edge of which extends beneath the slates of the other edge downwards to make contact with the wall of the building, the middle portions being formed into a channel section.

6,391 of 1905.—E. J. CLARKE: *Grinding Apparatus for Manufacturing Cement.*

Apparatus for the manufacture of cement, consisting in the combination of a block, a revolving metal brush engaging with the upper surface of said block, an aperture in said brush down which the substance to be treated is passed, the substance being thoroughly ground and mixed in passing through the brush and over the surface of the block, a spindle carrying said metal brush, a casing surrounding the said brush and block, an aperture in said casing for the egress of the substance treated, and means for adjusting the height of said block.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 8.—By MORRIS, MARSHALL, & POOLE (at Newtown).

Kerry, Montgomery.—Great Gate Farm, 119 a. 2 r. 1 p., f.	£2,750
Oak Farm, 46 a. 0 r. 25 p., f.	900
Llandyssil, Montgomery.—Pen-y-Cwm Farm, 22 a. 3 r. 34 p., f.	575
"Sally Cottage," "Dingle House," and 8 a. 3 r. 22 p., f.	270

August 10.—By LANGRIDGE & FREEMAN (at Maidstone).

Yalding, Kent.—Congelow Farm, 77 a. 1 r. 32 p., f.	2,750
Hatch Gate, 52 a. 3 r. 33 p., f.	755
Two enclosures of pasture land, 11 a. 3 r. 13 p., f.	290

August 11.—By MORRIS, MARSHALL, & POOLE (at Bishops Castle).

Wentnor, Salop.—Adstone Estate, 241 a. 0 r. 37 p., f.	3,050

August 15.—By DEBENHAM, TEWSON, & Co.
Hammersmith.—7 and 9, South-st., u.t. 17¼ yrs., g.r. 5*l.* 10s., w.r. 78*l.* £335
August 17.—By L. CAVEY & Co.
Shepherd's Bush.—11, Augustus-rd., u.t. 58 yrs., g.r. 10s., y.r. 34*l.* 380
By STIMSON & SONS.
Leyton.—73, Grange Park-rd., l., e.r. 32*l.* 315
Blackfriars.—51, Nelson-sq., f., also 19, Surrey-row, u.t. 37½ yrs., g.r. 3*l.*, e.r. 65*l.* 550
Tooting.—Recovery-st., l.g. rents 63*l.*, u.t. 15½ yrs., at peppercorn ground rents 540
Maida Vale.—Bristol-gdns., l.g. rents 24*l.* 10s., u.t. 45 yrs., g.r. 2*l.* 405
Islington.—Warren-st., l.g. rents 65*l.*, u.t. 22 yrs., g.r. 18*l.* 520
Peckham.—23 to 53 (odd), Hardcastle-st., u.t. 58 yrs., g.r. 96*l.*, w.r. 625*l.* 4,140
134, Queen's-rd., u.t. 144 yrs., g.r. 15*l.*, e.r. 75*l.* 1,120

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETING.

SATURDAY, SEPTEMBER 2.

Incorporated Association of Municipal and County Engineers.—Midland District Meeting to be held at Kettering.

TO CORRESPONDENTS.

G. P. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.		
Hard Stocks	1	8	0	per 1000	alongside, in river.
Rough Stocks and Grizzles	1	4	0	,,	,, ,,
Facing Stocks	2	0	0	,,	,, ,,
Shippers	2	0	0	,,	,, ,,
Flettons	1	7	0	,,	at railway depôt.
Red Wire Cuts	1	14	0	,,	,, ,,
Best Fareham Red	3	12	0	,,	,, ,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,, ,,
Best Blue Pressed Staffordshire	4	2	6	,,	,, ,,
Do. Bullnose	4	7	6	,,	,, ,,
Best Stourbridge Fire Bricks	4	0	0	,,	,, ,,
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers	12	0	0	,,	,, ,,
Headers	11	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	16	0	0	,,	,, ,,
Double Stretchers	19	0	0	,,	,, ,,
Double Headers	16	0	0	,,	,, ,,
One Side and two Ends	19	0	0	,,	,, ,,
Two Sides and one End	20	0	0	,,	,, ,,
Splays, Chamferred, Squints	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
Splays, Chamferred, Squints	14	0	0	,,	,, ,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.

BRICKS, &c. (*continued*).

	s.	d.		
Thames and Pit Sand	7	0	per yard,	delivered.
Thames Ballast	5	9	,,	,,
Best Portland Cement	27	0	per ton,	,,
Best Ground Blue Lias Lime	20	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	,,	,,
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	,,	,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	,,	,,

	s.	d.		
Ancaster in blocks	1	11	per ft. cube,	deld. rly. depôt.
Beer ,,	1	6	,,	,,
Greenshill ,,	1	10	,,	,,
Darley Dale in blocks	2	4	,,	,,
Red Corsehill ,,	2	2		,,
Closeburn Red Freestone	2	0	,,	,,
Red Mansfield ,,	2	4	,,	,,

YORK STONE—*Robin Hood Quality.*

Scappled random blocks	2	10	,,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super.	,,
6 in. rubbed two sides ditto, ditto	2	6	,,	,,
3 in. sawn two sides slabs (random sizes)	0	11½	,,	,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	,,	,,
1½ in. to 2 in. ditto, ditto	0	6	,,	,,

HARD YORK—

Scappled random blocks	3	0	per ft. cube.	,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super.	,,
6 in. rubbed two sides ditto	3	0	,,	,,
3 in. sawn two sides (slabs random sizes)	1	2	,,	,,
2 in. self-faced random flags	0	5	,,	,,

	s.	d.		
Hopton Wood (Hard Bed) in blocks	2	0	per ft. cube.	deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7	per ft. super.	deld. rly. depôt.
,, ,, ,, 3 in. sawn both sides random slabs	1	0	,,	,,
,, ,, ,, 2 in. do.	0	8½	,,	,,

SLATES.

in.	in.		£	s.	d.		
20 × 10	best blue Bangor		13	2	6	per 1000 of 1200	at r. d.
20 × 12	,,	,,	13	17	6	,,	,,
20 × 10	first quality	,,	13	0	0	,,	,,
20 × 12	,, ,,	,,	13	15	0	,,	,,
16 × 8	,, ,,	,,	7	5	0	,,	,,
20 × 10	best blue Portmadoc		12	12	6	,,	,,
16 × 8	,,	,,	6	12	6	,,	,,
20 × 10	best Eureka unfading green		15	17	6	,,	,,
20 × 12	,,	,,	18	7	6	,,	,,
18 × 10	,,	,,	13	5	0	,,	,,
16 × 8	,,	,,	10	5	0	,,	,,
20 × 10	permanent green		11	12	6	,,	,,
18 × 10	,,	,,	9	12	6	,,	,,
16 × 8	,,	,,	6	12	6	,,	,,

TILES.

	s.	d.		
Best plain red roofing tiles	42	0	per 1000 at	rly. depôt.
Hip and Valley tiles	3	7	per doz.	,, ,,
Best Brosely tiles	50	0	per 1000	,, ,,
Do. Ornamental tiles	52	6	,,	,, ,,
Hip and Valley tiles	4	0	per doz.	,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000	,, ,,
Do. Ornamental do	60	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	0	,,	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000	,, ,,
Do. Ornamental do	54	6	,,	,, ,,
Hip tiles	4	1	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000	,, ,,
Best Ornamental tiles	50	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,
Best "Hartshill" brand plain tiles, sand faced	50	0	per 1000	,, ,,
Do. pressed	47	6	,,	,, ,,
Do. Ornamental do	50	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	6	,,	,, ,,

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 3 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	,,	,,	,,
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0

WOOD (*continued*).

BUILDING WOOD (*continued*)	At per standard. £	s.	d.	£	s.	d.
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		
	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

JOINERS' WOOD.	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in by 11 in.	18	10	0	20	0	0
,, ,, 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg :— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
,, ,, 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, ,, 3 in. by 9 in.	12	10	0	13	10	0
,, ,, battens	10	0	0	11	0	0
Pitch-pine: deals	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	,,		
Seconds, regular sizes	33	0	0	,,		
Yellow Pine oddments	28	0	0	,,		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	0	3	6
Small ,, ,,	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube.	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	9
¾ in. do. do.	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0

Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. do. do.	0	14	0	0	18	0
¾ in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	12	9	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	6	0	0	...	6	15	0
Compound Girders, ordinary sections	7	10	0	...	8	10	0
Steel Compound Stancheons	9	2	6	...	10	12	6
Angles, Tees and Channels, ordinary sections	7	10	0	...	8	10	0
Flitch Plates	7	15	0	...	8	5	0
Cast Iron Columns and Stanchions including ordinary patterns	6	12	6	...	7	15	0

METALS.

	Per ton, in London. £	s.	d.		£	s.	d.
IRON— Common Bars	7	0	0	...	7	10	0
Staffordshire Crown Bars, good merchant quality	7	10	0	...	8	0	0
Staffordshire "Marked Bars"	9	10	0	...	—		
Mild Steel Bars	8	5	0	...	8	15	0
Hoop Iron, basis price	8	15	0	...	9	0	0
,, ,, Galvanized	16	10	0	...	—		
(*And upwards, according to size and gauge.)							
Sheet Iron, Black— Ordinary sizes to 20 g.	9	0	0	...	—		
,, ,, 24 g.	10	0	0	...	—		
,, ,, 26 g.	11	15	0	...	—		
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	10	0	...	—		
Ordinary sizes to 22 g. and 24 g.	13	0	0	...	—		
26 g.	14	0	0	...	—		
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	15	10	0	...	—		
,, ,, 22 g. and 24 g.	16	0	0	...	—		
,, ,, 26 g.	17	10	0	...	—		

PRICES CURRENT.—*Continued on page 243.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*DESIGNS FOR DOUBLE & SINGLE SHOP FRONT	W. H. Smith & Son	75*l.*	Oct. 9
*SECONDARY SCHOOL FOR GIRLS	County Borough of Preston	50*l.*, 30*l.*, and 20*l.*	Oct. 16

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Street Improvements, Evansfield-road, Whitchurch	Llandaff and Dinas Powis R.D.C.	J. Holden, Surveyor, Park House, 20, Park-place, Cardiff	Aug. 29
Street Improvements, West-road, Whitchurch	do.	do.	do.
Street Improvements, Belle Vue-crescent, Whitchurch	do.	do.	do.
Street Improvements, Hawthorn-rd. W., Whitchurch	do.	do.	do.
Repairs, etc., Earl-street, Tredegar, Council School	Monmouthshire Education Com.	D. Morgan, F.R.I.B.A., Charles-street-chambers, Cardiff	do.
Repairs, etc., Bedwellty Pits, Council School	do.	do.	do.
Elementary School at Messingham, near Kirton	Lindsey County Council Educ. Com.	Scorer & Gamble, Architects, Bank-street-chambers, Lincoln	do.
Additions, etc., to Pisgah C. M. Chapel, Penygraig	.....	R. S. Griffiths, Architect and Surveyor, Tonypandy	do.
House and Shop, High-street, Dovercourt	.....	H. S. Watling, F.S.A., Architect, Kingsway House, Dovercourt	do.
Business Premises, Bridge-street, Godalming	Godalming Co-operative Society	H. Moon, Architect, 96, High-street, Godalming	do.
Four Houses at Honley, near Huddersfield	.....	E. W. Lockwood, 37, Byram-arcade, Huddersfield	do.
Three Dwelling Houses, Medomsley, Durham	Messrs. Robson & Daglish	W. Barron, 3, West-view, Blackhill	do.
Twenty Houses, Fleur-de-Lis	Buttry Hatch Building Club	C. Telford Evans, Architect, 8, Queen-street, Cardiff	Aug. 30
Additions, etc., Redcliff Boys' School, Bristol	.....	W. V. Gough, Architect, 24, Bridge-street, Bristol	do.
Alterations, etc., to Premises, The Parade, Usk	Rev. P. L. C. Nash	W. H. Dashwood Caple, Architect, Cardiff	do.
2,600 lin. yds. 9-in. Sewer, Lime-rd. to Larbert Bridge	Eastern Committee of Stirling C.C.	James Strong, C.E., Architect, Falkirk	do.
400 yds. of Newbridge Stone Kerbing in Cardiff-road	Llandaff and Dinas Powis R.D.C.	J. Holden, Surveyor, Park House, 20, Park-place, Cardiff	do.
C.I. St. Name Plates & Enamel Door Nos., Whitchurch	do.	do.	do.
100 lineal yds. of 9-in. Pipe Sewer, Highwalls, Dinas	do.	do.	do.
Alterations, etc. Farthinghoe County Schools	The Managers	W. J. Treadwell & Son, Architects, Middleton Cheney	do.
Blackbrook Temporary Main	Loughborough Corporation	A. H. Walker, Engineer, Town Hall, Loughborough	do.
Premises, Chichester-street, Belfast	John Robson, Ltd.	S. C. Hunter, Scottish Provident-buildings, Belfast	do.
Stone and Iron Fencing, Royal-terrace Gardens	Edinburgh Corporation	R. Morham, City Architect, Public Works Office, Edinburgh	do.
New English Congregational Chapel at Ynysybwl	The Building Committee	A. Richards, 61, Robert-street, Ynysybwl	Aug. 31
1,100 yds. of Wrought-iron Fencing and Gates	Todmorden Town Council	Waterworks Offices, 5, Rochdale-road, Todmorden	do.
*ELEMENTARY SCHOOLS AT WOLVERTON	Bucks County Education Committee	Harrington, Key, & Kersham, 65, Bishopsgate-st. Without, E.C.	do.
Repaving, etc., Works, Bury New-road	Prestwich U.D.C.	Office of Surveyor, Chester Bank, Prestwich	Sept. 1
Cleaning and Siding of Drains, Selby Dam	.....	R. B. Parker, Clerk to Commissioners, Abbey-yard, Selby	do.
Cleaning and Siding of Drains, Bishop Dyke	.....	do.	do.
Painting, Colouring, etc., District Schools, Wigmore	Walsall & W. Bromwich Schl. Dis.	J. W. Allen, Architect, High-street, West Bromwich	do.
Two Steel Cornish Boilers, etc., at Union Workhouse	Hereford Guardians	R. Moore, Clerk, 8, St. John-street, Hereford	do.
Making-up Northern Part of Albert-road	Branksome U.D.C.	S. J. Newman, Surveyor, Lake-road, Branksome	do.
Alterations at Aberdare Training Schools	Merthyr Tydfil Guardians	T. Roderick, Architect, Clifton-street, Aberdare	do.
Electricity Works	Ashton-under-Lyne Corporation	Borough Electrical Engineer, Wellington-rd., Ashton-under-Lyne	Sept. 2
Materials	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	do.
Water Softening and Purifying Plant	Salford Electricity Committee	Borough Electrical Engineer, Elec. Works, Frederick-rd., Salford	do.
Materials	Chester Corporation	J. H. Dickson, Town Clerk, Town Hall, Chester	do.
65 Lineal yds. of 9-in. Pipe Sewer, etc.	Ruislip-Northwood U.D.C.	W. L. Carr, Council Offices, Northwood, R.S.O., Middlesex	do.
820 yds. of 12-in. Cast-iron Drain for Sewage Works	Caversham U.D.C.	A. J. Smith, Surveyor, Council Offices, Caversham	do.
Workmen's Dwellings	Exeter Corporation	T. Moulding, City Engineer, Exeter	do.
Six Cottages at County Asylum, Exminster	.....	E. H. Harbottle, County-chambers, Exeter	do.
Retort House, Boiler House, etc., at Gas Works	The Gas Company	A. F. Phillips, Engineer, 38, Parliament-street, S.W.	do.
*TWO METER HOUSES	Coventry Gas Committee	F. W. Stevenson, Engineer, Gas Works, Coventry	Sept. 4
*PREPAR. OF FOUNDS. FOR PURIFIERS, ETC.	do.	do.	do.
Private Street Works, Back Roads, Goldthorpe	Bolton-on-Dearne U.D.C.	Surveyor, Council Offices, Bolton-upon-Dearne, Rotherham	do.
Iron Lighthouse, Knala Selangor, Straits Settlement	Trinity House, E.C.	A. Owen, Secretary	do.
Infants' School at Shepton Mallet	Somerset County Council	A. J. Pictor, Architect, Bruton, Somerset	do.
Convn for Women, nr. King Edward VII. Bdg., Kew	Richmond Corporation	Borough Surveyor, Town Hall, Richmond, Surrey	do.
Small Farmhouse at Ramsicombe, Botusfleming	.....	H. A. Hosking, Architect, Landrake, St. Germans, Cornwall	do.
Additions, etc., Waterloo-street Sub-Station	Glasgow Corporation	W. W. Lackie, Electrical Engineer, 75, Waterloo-street, Glasgow	do.
House, Hengoed	Mrs. Perrott	P. Vivian Jones, Architect and Surveyor, Hengoed	do.
Concreting and Kerbing Footpaths	Dalkey U.D.C.	J. P. Gahan, Clerk, Town Hall, Dalkey, Ireland	do.
Private Street Works	Eiland U.D.C.	P. H. Whitwam, Surveyor, Council Offices, Eiland	Sept. 5
Extension to Carsheds (Electric Tramways)	Derby Corporation	J. Ward, Borough Surveyor, Babington-lane, Derby	do.
Alterations, etc., to "Rose and Crown," Goodwick	Pembrokeshire Estate Co.	Jenkinson & White, 1, Princes-street, Westminster, S.W.	do.
Playshed at S. Benwell Council School	Newcastle-on-Tyne Education Com.	A. Goddard, Sec., Educa. Offices, Northumberland-rd, Newcastle	do.
Paving, etc., in Pembroke-crescent	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	Sept. 6
*ALTERS., ETC., MILLFIELD HMS., RUSTINGTON	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
Covered Service Reservoir	Selby U.D.C.	P. Griffiths, Engineer, 54, Parliament-street, Westminster, S.W.	do.
Materials	Rochester Corporation	W. Banks, City Surveyor, Guildhall, Rochester	do.
Alterations, etc., Glascoed Council School	Eastern Valleys Group of Managers	H. J. Griggs, Architect, Newport, Mon.	do.
Alterations, etc., Upper Cwmbran Council School	do.	do.	do.
Alterations, etc., St. Dials Council School, Cwmbran	do.	do.	do.
Alterations, etc., to Schoolroom, Brynmawr	Trustees of Tabor Baptist Chapel	H. Waters, Architect, Beaufort	do.
Southwell Sewerage, Contract No. 1	Southwell R.D.C.	H. Walker & Son, Engineers, Albion-chbrs., King st., Nottingham	Sept. 7
Southwell Sewerage, Contract No. 2	do.	do.	do.
Sewering Parts of Gainsborough Drive, etc.	Southend-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea	do.
*COASTGUARD BLDGS., NELL'S POINT, BARRY	Admiralty	Civil Engineer, H.M. Dockyard, Pembroke Dock	Sept. 8
Central Technical School Premises, Waterford	Technical Instruction Committee	J. J. Feely, Town Hall, Waterford	do.
*SECOND. SCH. FOR GIRLS, HIGH WYCOMBE	Chepping Wycombe Town Council	Borough Surveyor, Euston-street, High Wycombe	Sept. 11
Cartage of Road Metal	Ryton U.D.C.	J. P. Dalton, Surveyor, Ryton-on-Tyne	do.
Pumping Machinery for Dry Dock, Avonmouth	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland-road, Bristol	do.
*PAIN. PROPERTY, MALTON & THIRSK BRANCH	North-Eastern Railway Company	H. J. Rudgard, Company's District Engineer, York	do.
*UNDERGROUND CONVEN. IN GOSWELL-RD.	Metropolitan Borough of Finsbury	Boro' Surveyor's Office, Finsbury Town Hall, Rosebery-av., E.C.	do.
14 h.p. Motor Ambulance	Cardiff Corporation	J. L. Wheatley, Town Clerk, Cardiff	Sept. 12
*ADDITIONS TO WORKHOUSE AT ISLEWORTH	Brentford Guardians	Clerk to the Guardians, Union Offices, Isleworth, Middlesex	do.
*ROAD CONSTRUC., OVINGDEAN, NR. BRIGHT'N	.....	E. Millard, 1, Finsbury-circus, London, E.C.	do.
Two Cottages, Gladstone-street, Hathern, Leicester	Co-operative Society	S. Smith, Tanner's-lane, Hathern	Sept. 13
Materials	Gosport and Alverstoke U.D.C.	H. Frost, Surveyor, Town Hall, Gosport	Sept. 14
*REDEC. RECEIVING HOME FOR CHILDREN	Fulham Guardians	Guardians' Offices, Fulham Palace-road, Hammersmith, W.	do.
Additions, etc., to Norton's Cross Council School	Monmouthshire Education Com'tee	A. Swash, Architect, Midland Bank-chambers, Newport	Sept. 15
*ASPHALT. PLAYGR., CHERITON COT. HOMES	Elham Guardians	.....	do.
*REPAIRS, ETC., TO CHARTHAM ASYLUM	Kent County Lunatic Asy. Visitors	W. J. Jennings, Architect, 4, St. Margaret's street, Canterbury	do.
*ALTER., HEAD ATTEND. OFF., CHARTHAM ASY.	do.	do.	do.
Granite (2,000 tons)	Harrow-on-the-Hill U.D.C.	J. P. Bennett, Surveyor to Council, Harrow	Sept. 16
120 yds. of Coarse and 150 yds. of Fine Gravel	do.	do.	do.
Villa Residence, Clinton-road, Redruth	Mr. J. Simmons	H. W. Collins, Architect and Surveyor, Clinton-road, Redruth	do.
6,000 yds. of Pipe Track, etc., Castlebay I. of Barra	.....	J. Wedderspoon, Engineer, The Castle, Inverness	do.
Hollingbourne Workhouse Sewerage	The Guardians	Fairbank & Son, C.E., Lendall-chambers, York	Sept. 18
Making-up Roadway	Stevenage U.D.C.	W. O. Times, Clerk, Orchard-road, Stevenage	do.
*PAVING AND MAKING-UP NEW STREET	Camberwell Borough Council	Borough Engineer, Town Hall, Peckham-road, S.E.	do.
Camberley Sewerage and Sewage Disposal	Frimley U.D.C.	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	Sept. 21
*ERECTION OF CHURCH HOUSE AT BARNET	Barnet Chancel Estate Trustees	E. Dolton, 35, Wood-street, Barnet	Sept. 23

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
1,350 tons of 1¼-in. Broken Granite	Bishop's Stortford U.D.C.	T. Swatheridge, Clerk, Council Offices, North-st., Bishop's Stortford	Sept. 25
120 tons of ½-in. Granite Chippings	do.	do.	do.
*BLKS. OF BLDNG. AT WESTMINSTR. TECH. INST.	L.C.C.	Superintending Architect's Dept., 15, Pall Mall East, S.W.	Sept. 26
Congre. Schs. & Class-rooms, Dewsbury-road, Leeds	.....	Danby & Simpson, Architects, 73, Albion-street, Leeds	No date.
Driving Cross-Measure Drift (300 yds. long)	.....	The Manager, Gelli Colliery, Ystrad, Rhondda	do.
Renovation of Wesleyan Chapel, Pitt-street, Barnsley	.....	G. Moxon, Architect, 26, Church-street, Barnsley	do.
*ADDIS., SIMON LANGTON SCHS., CANTERBURY	.....	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	do.
Clean. and Tar. Inside of Roof, Deighton Ironworks	.....	L. D. Whitehead & Co., Tredegar	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*GENERAL FOREMEN (2)	Northern Nigeria P.W. Dept.	250*l.*, etc.	Aug. 31
*FOREMAN OF WORKS	Gold Coast P.W. Dept.	250*l.*, etc.	Sept. 2
*TEACHER OF BUILDING CONSTRUCTION	Middlesex Education Committee	10*s.* per evening	do.
*BUILDING INSPECTOR	Northamptonshire C. C.	150*l.* per annum	Sept. 4

Those marked with an asterisk (*) are advertised in this number. ***Competitions,*** iv. ***Contracts,*** iv. vi. viii. x. ***Public Appointments,*** xvii.

PRICES CURRENT—*Continued from page 241.*

METALS (*continued*).

IRON—*continued.*	Per ton, in London.
Galvanised Corrugated Sheets—	
Ordinary sizes 6 ft. to 8 ft. 20 g.	£12 10 0 ... —
„ „ 22 g. and 24 g.	13 0 0 ... —
„ „ 26 g.	13 15 0 ... —
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 0 0 ... —
Best Soft Steel Sheets, 22 g. & 24 g.	12 0 0 ... —
„ „ 26 g.	13 10 0 ... —
Cut nails, 3 in. to 6 in.	9 0 0 ... 9 10 0
(Under 3 in., usual trade extras.)	

LEAD, &c.	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	16 10 0 ...	—
Pipe in coils	17 0 0 ...	—
Soil pipe	19 10 0 ...	—
Compo pipe	19 10 0 ...	—
ZINC—Sheet—		
Vieille Montagne ....ton	29 15 0 ...	—
Silesian	29 10 0 ...	—
COPPER—		
Strong Sheet....per lb.	0 0 11 ...	—
Thin „ .... „	0 1 0 ...	—
Copper nails .... „	0 0 11 ...	—
BRASS—		
Strong Sheet.... „	0 0 10 ...	—
Thin „ .... „	0 0 11 ...	—
TIN—English Ingots .... „	0 1 6 ...	—
SOLDER—Plumbers' .... „	0 0 7 ...	—
Timmen's.... „	0 0 8¼ ...	—
Blowpipe.... „	0 0 ¢½ ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
„ fourths	1½d. „ „
21 oz. thirds	3½d. „ „
„ fourths	2½d. „ „
26 oz. thirds	4½d. „ „
„ fourths	3½d. „ „
32 oz. thirds	5½d. „ „
„ fourths	4½d. „ „
Fluted Sheet, 15 oz.	3d. „ „
„ 21 oz.	4d. „ „
½ Hartley's Rolled Plate	2d. „ „
⅝ „ „ „	2½d. „ „
¾ „ „ „	2¾d. „ „

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 7½
„ „ „ in barrels	„	0 1 9
„ „ „ in drums	„	0 1 11
Boiled „ „ in pipes	„	0 1 10
„ „ „ in barrels	„	0 1 11
„ „ „ in drums	„	0 2 1
Turpentine, in barrels	„	0 3 7
„ in drums	„	0 3 9
Genuine Ground English White Lead	per ton	19 15 0
Red Lead, Dry	„	19 5 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China Ceylon, etc., 26s. per annum. Remittances (payable to J MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARNET.—For alterations and additions to Workhouse, for the Guardians. Messrs. White, Son, & Pill, architects, 13 and 15, High-street, Barnet:—

Sprosson & Babb	£1,776 17 6	B. A. Belton	£1,442 0 0
J. Baughen	1,493 0 0	W. M. Butcher	1,440 0 0
S. Worboys	1,474 0 0	Winter & Sons	1,406 15 0
Harris & Co., Ltd.	1,459 0 0	Smith & Co.	1,363 18 2
		J. Thomas, Enfield*	1,325 0 0

BEAULIEU (Hants).—For erecting a new church at Park, near Beaulieu, for the Lord Montagu of Beaulieu. Mr. Harold Brakspear, F.S.A., architect, Corsham, Wilts:—

R. E. D. Rudman, Chippenham* £1,447

BEDDINGTON (Surrey).—For repairs and decorations to Wandle Court, Beddington, Surrey, for Mr. A. H. Allen. Messrs. Pepler & Allen, architects, 3, George-street, Croydon:—

Worsfold & Sons	£297 0	Umlandt & Nicoll	£276 5
H. Gent	292 5		

BRADFORD.—Accepted for the conversion of male hospital block into male infirmary block at the Union Workhouse, Horton-lane, for the Guardians. Mr. F. Holland, engineer and architect, 11, Parkinson's-chambers, Hustlergate, Bradford:—

Hoist Engineers: Easton Lift Co., London	£345 0
Plasterers: Crabtree & Berry, Great Horton	101 14
Joiners: W. H. Dyer & Son, Bower-street	85 0
Painter: W. Townson, Holme Top-street	69 10
Plumber: C. Howroyd, Clarence	41 0
Masons: O. Booth & Son, Great Horton, Bradford	15 10

BRENTWOOD.—For the conversion of the Model Lodging-house into a working men's club, for Mr. J. W. Cook, J.P. Mr. H. R. Bird, architect and surveyor, Brentwood:—

Alterations.

		Schedule 2.
E. Dix	£1,190	£38 0
F. W. Burtwell	1,120	29 0
F. W. Jarvis	1,049	29 15

Painting.

W. Dean & Sons £84

BURRINGTON (Devonshire).—For restoration of farmhouse and buildings at Hill Farm, for Mr. M. T. Leamon, of Tavistock. Messrs. J. Hannaford & Son, surveyors, Chulmleigh:—

Backwell	£880 10	Parsons	£773 11
Pethrick	795 0	J. Ford, Burrington*	772 0
Rogers	780 0		

CANWELL (Staffs.)—For additions to the hall and stable courtyard and erection of a new farmhouse at Roughley, on the Canwell Hall Estate, for Mr. Philip S. Foster, M.P. Mr. C. M. C. Armstrong, architect, 5, High-street, Warwick:—

W. J. Whittall & Son, Birmingham* .. £1,199 18 3

CELBRIDGE.—For building chimney stack and for painting, etc., Workhouse buildings, for the Guardians. Mr. J. J. Inglis, C.E., 18, Nassau-street, Dublin:—

Chimney Stack.

J. Cromer, Lucan* £140

Painting and Workhouse Improvements.

J. Eacret, Naas* £148 5

CLOYNE.—For building two cottages at Castle Mary, for Colonel Longfield. Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork:—

J. J. Coffey, Midleton, Co. Cork* £385

COULSDON (Surrey).—For the erection of a detached residence in Riddlesdown-road, Coulsdon, Surrey, for Mrs. Thompson. Messrs. Pepler & Allen, architects, 3, George-street, Croydon:—

E. J. Saunders	£1,095	Worsfold & Sons	£894
Grace & Marsh	914	W. Potter*	875

DUNSTON.—For formation, etc., of Back Banky Field-terrace, etc., for the Urban District Council. Mr. J. S. Renton, Surveyor, Council Offices, Whickham:—

O. Pescod	£894 1 10	W. Cumming	£730 1 0
G. E. Simpson	874 19 0	J. W. Robson Newcastle*	682 16 5
J. Brown	806 15 11		

[Surveyor's estimate, £712 0 0.]

EAST DEREHAM (Norfolk).—For erecting two small villa residences in Wellington-road, East Dereham, for Mr. John Edgeley. Mr. W. D. Hubbard, architect and surveyor, East Dereham:—

H. Mack	£462
G. Took*	450

GARTH (Breconshire).—For repairs and renovations to Abergwessin Church, for the Rev. Thomas Jones, vicar. Mr. D. Jenkins, architect, Llandilo:—

D. Price, Llangadock* £125

GLYN-NEATH.—For alteration, extension, re-roofing, and heating of Addoldy Chapel, for the Building Committee. Mr. J. Cook Rees, architect, Neath:—

W. Harrett & Sons	£1,565 0 0	Thomas & Jones	£1,525 0 0
Waring, Cole, & Waring	1,542 1 3	D. Davies	1,495 0 0
Walters & Johns	1,542 0 0	D. Jenkins	1,460 0 0
		J. D. Wilkins	1,392 9 7
		Price Bros., Canton, Cardiff*	1,367 0 0

HALE (Cheshire).—For new sewerage and drainage works, for the Urban District Council. Mr. F. J. Lobley, Engineer:—

T. Norgrave	£2,771 13 0	E. Schofield	£1,707 9 0
J. Riley	2,091 9 0	G. Boyson	1,694 0 0
Mitchell & Son	1,901 0 0	S. Hutton	1,545 0 4
T. H. Macdonald	1,821 0 0	I. E. Mayall	1,521 0 0
Smith & Co.	1,765 4 8	R. C. Brebnor	1,517 0 0
Edmondson & Wyatt	1,739 6 9	R. Allen, Widnes, Lancs.*	1,469 10 10

HULL.—For the Sun Fire Office, Lowgate, Hull. Mr. B. S. Jacobs, architect and surveyor, Bowlalley-lane, Hull:—

Quibell, Son, & Greenwood	£5,285 17 8	E. Good & Sons, Ltd.	£5,034 0 0
Hockney & Liggins	5,199 0 0	F. Singleton	5,003 0 0
Bowman & Sons	5,185 0 0	M. Harper	4,994 19 0
Morrell & Sons	5,146 7 0	G. Houlton	4,976 0 0
W. Sanderson	5,129 0 0	Hebblewhite & Wilson	4,970 0 0
F. Bellby	5,119 0 0	T. Goates	4,969 0 0
F. Southern	5,050 0 0	G. Longden & Sons, Ltd., Sheffield*	4,960 0 0

KETTERING.—For erecting a Primitive Methodist Church, for the trustees of the Primitive Methodist properties in Kettering. Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley. Quantities by architects:—

O. P. Drever, Round Hill-road, Kettering £1,997 17

LLANDILO.—For building a detached villa at New-road, for Mr. John Thomas, Rhosmaen. Mr. D. Jenkins, architect, Llandilo:—

W. T. Preswylfa, Llandilo* £877 10

LLANDOVERY.—For building a cottage at Cynghardy, for Mr. J. M. Lloyd, London, N.W. Mr. D. Jenkins, architect, Llandilo :—

D. Price, Llangadock* £297

LONDON.—For sanitary work at the Infirmary in Brook-street, Kennington-road, S.E., for the Lambeth Guardians. Mr. S. R. J. Smith, architect, 15, York-buildings, Adelphi, W.C. :—

H. King & Son	£595 0 0	P. B. Evans & Co.	£355 0 0
E. A. Williams & Co.	456 1 7	Davey & Roberts	351 10 0
F. W. Brock ..	455 13 9	W. M. Glendinning.....	344 0 0
S. G. Crook ..	447 9 6	J. Knight & Sons.....	327 0 0
H. Bragg & Sons	439 0 0	G. H. James ..	326 4 2
F. Kinnaird ..	429 0 0	W. Lawrence & Son	325 15 0
P. H. Allin & Sons	425 0 0	Crabb & Son ..	324 0 0
R. Harding & Son	415 0 0	G. Jennings, Ltd.	319 15 0
J. Johnson	410 0 0	E. Wall	318 0 0
M. Calnan & Son	379 0 0	H. C. Payne ..	270 0 0
S. Kind	367 10 0	H. Kent, 17, Albion-road, Lewisham* ..	259 0 0
Victoria Sanitary Engineering Co...	367 10 0		
J. Fenn Scott..	359 15 0		

LONDON.—For making-up and paving Finland-road, etc., for the Deptford Borough Council :—

Finland-road.

E. J. Etheridge, Rollin's-street, Deptford, S.E. £1,203

Revelon-road.

E. J. Etheridge, Rollin's-street, Deptford, S.E. £1,565

Horsted-road.

E. J. Etheridge, Rollin's-street, Deptford, S.E. £266

Arica-road.

E. J. Etheridge, Rollin's-street, Deptford, S.E. £627

Road leading from Knoyle-street to Cottesbrooke-street.

E. J. Etheridge, Rollin's-street, Deptford, S.E. £579

LONDON.—For the conversion of the front block of the Norwood Old School premises into a home for aged poor, for the Lambeth Guardians. Mr. E. C. Beaumont, architect, 78, Fleet-street, E.C. Quantities by Messrs. Dow, White, & Gee, 12, Craven-street, Strand, W.C. :—

E. Mills	£6,901	Patman & Fotheringham, Ltd. ..	£5,703
C. Blyton & Sons..	6,860	G. Godson & Sons	5,693
C. Ansell	6,800	H. Groves	5,655
Sprekley & Co.....	6,448	H. Kent	5,413
J. T. Meason & Sons	6,390	C. Dearing & Son	5,393
C. Wales	6,293	L. F. Lamplough ..	5,389
J. Bowyer & Co. ..	6,145	B. C. Nightingale	5,364
S. Pocock	6,128	Marriott & Salter..	5,160
H. Bragg & Sons ..	6,000	G. Wales & Co.....	5,030
F. Bryen	5,998	W. Lawrence & Son	4,984
J. Barker & Co. ..	5,923	J. Parsons	4,775
J. G. Baker & Son	5,920	E. Wall	4,635
Marrison & Harvey	5,900	S. E. Moss & Co., Bournemouth Park-road, South-end-on-Sea*	4,500
Martin, Wells, & Co.	5,850		
U. Smith & Son ..	5,774		

LONDON.—For alterations and additions to I. Stanley & Co.'s premises, Lavender-hill, S.W. Mr. W. C. Poole, architect, 62, Belleville-road, Wandsworth-common, S.W. Quantities were supplied :—

Hudson Bros.	£1,270	Wills	£1,120
Lathey Bros.	1,209	Spencer, Santo, & Co.	1,100
Johnson & Co.	1,205	Triggs	1,100
Heather.....	1,172	Tucker, Lavender-hill, S.W.*	1,089
Chinchin & Co. ..	1,169		
Turrle & Appleton	1,167		
Dearing & Son....	1,150		

MARCH.—For erecting temporary iron building, for the Isle of Ely Education Committee. Mr. R. S. Perkins, architect :—

F. Smith & Co. ..	£735 0	C. Redhead	£488 16
Ginger, Lee, & Co.	688 0	R. Shanks	485 0
T. J. Hawkins & Co.	686 5	J. Swann.....	484 0
Boulton & Paul, Ltd.....	657 0	A. Christmas & Sons, St. Peter's-road Steam and Joinery Works, March*.....	482 10
W. Harbrow	612 10		
G. W. Heath	565 0		
J. Lindall & Son	550 9		

MIDDLEWICH.—For erecting school buildings, King Edward-street, for the sub-committee for the Winsford and Middlewich District. Mr. J. Cawley, architect, Bull-ring, Northwich :—

H. Fairclough, Warrington‡..... £9,410

[‡ Accepted subject to the approval of County Education Committee].

PORTLAND.—For alterations and additions to the Jubilee Hall, for the South Portland Working Men's Conservative Club. Mr. Wilfred Wright, architect, Portland :—

Jesty & Baker	£395 0 0
E. Winter, Park-road, Portland* ..	321 10 0

RHOSDDN.—For constructing a 9-in. stoneware pipe sewer, for the Wrexham Rural District Council. Mr. J. Price Evans, engineer, Argyle-chambers, Wrexham :—

P. Doyle.....	£393 0 0
Jameson & Son	265 0 0
R. Williams	263 10 6
H. A. Jones	225 0 0
G. Halbert, Rhosnessney, Wrexham*	210 19 5

RUGBY.—For outside staircase, 3-in. water main, etc., at the Workhouse, for the Guardians. Mr. T. W. Willard, architect, Rugby :—

A. Harris, Dunchurch-road, Rugby* £107

SULLY.—For erecting two houses, for Mr. A. T. Stephen. Mr. R. B. Batchelor, architect, 19, Duke-street, Cardiff. Quantities by the architect :—

F. Bond	£1,029 0 0	G. H. Elkington	£826 0 0
J. Humphries	880 10 0	J. Britton, Dinas Powis*	802 0 0
W. Vaughan .	830 0 0		

THAMES DITTON.—For constructing forty loose boxes at Imber Court Park, for the Association of Trotting Horse Owners, Ltd. Mr. J. M. H. Gladwell, architect. Stratford, E. :—

Higgs & Outhwaite	£857 0	Sycamore Works, Ltd.....	£589 15
Harbour & English	744 0	Sansom & Bishop	580 0
J. Barker	739 0	F. Deacon & Co..	544 0
Pearce.....	599 0	Wrowley & Co., Woking*.....	499 0
Fenn & Co.	598 0		

WHITLEY.—For private street improvement works, for the Whitley and Monkseaton Urban District Council. Mr. J. Moore, Surveyor, Council Buildings, Whitley Bay :—

Thornton & Co.	£2,407 4 3	M. D. Young	£2,227 6 9
J. W. Robson	2,308 19 0	G. E. Simpson, Newcastle*	2,209 6 4

[Surveyor's estimate, £2,399 19s. 7d.]

WREXHAM.—For new infirmary buildings, extension of laundry, etc., at the Workhouse, for the Guardians. Mr. G. Morison, architect and surveyor, King-street, Wrexham :—

Dryland & Preston, Littleborough, near Manchester* £10,469

[Nine other Tenders were received.]

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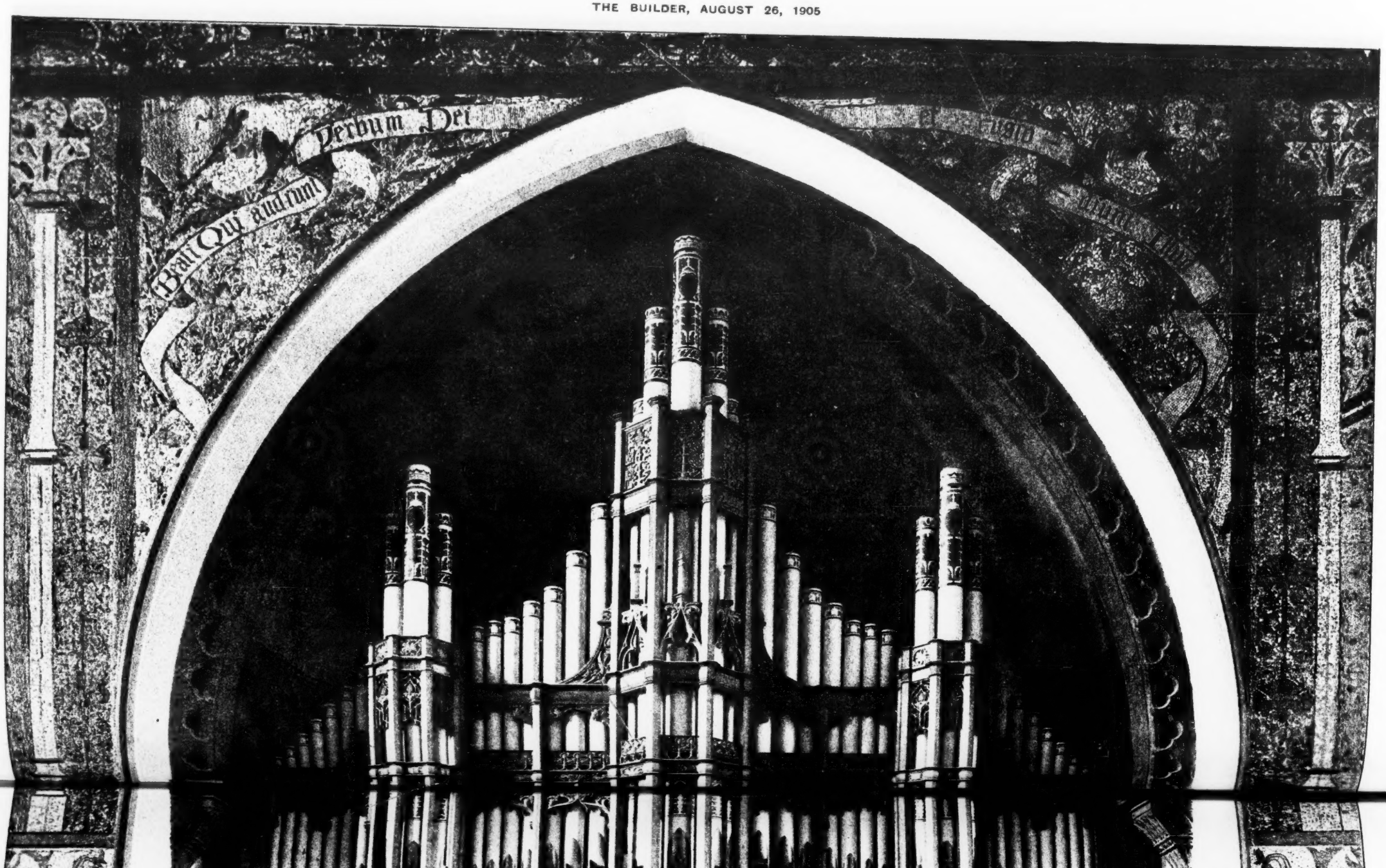
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ORGAN CASE, ST. PAUL'S SCHOOL.—Mr. T. R. Spence, Architect.

LANGFORD MANOR SOMERSET: NORTH FRONT FROM THE ORCHARD AS RESTORED: RUPERT C. RUSTIN, A.R.I.B.A. ARCHITECT

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THE RESTORATION OF LANGFORD MANOR, SOMERSET FOR MRS MATTERSON.

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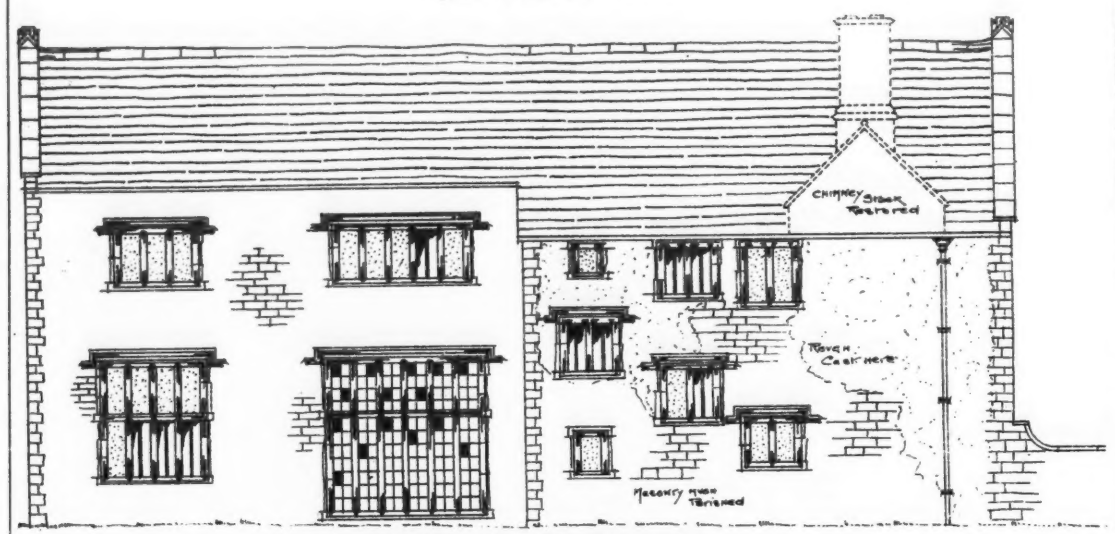
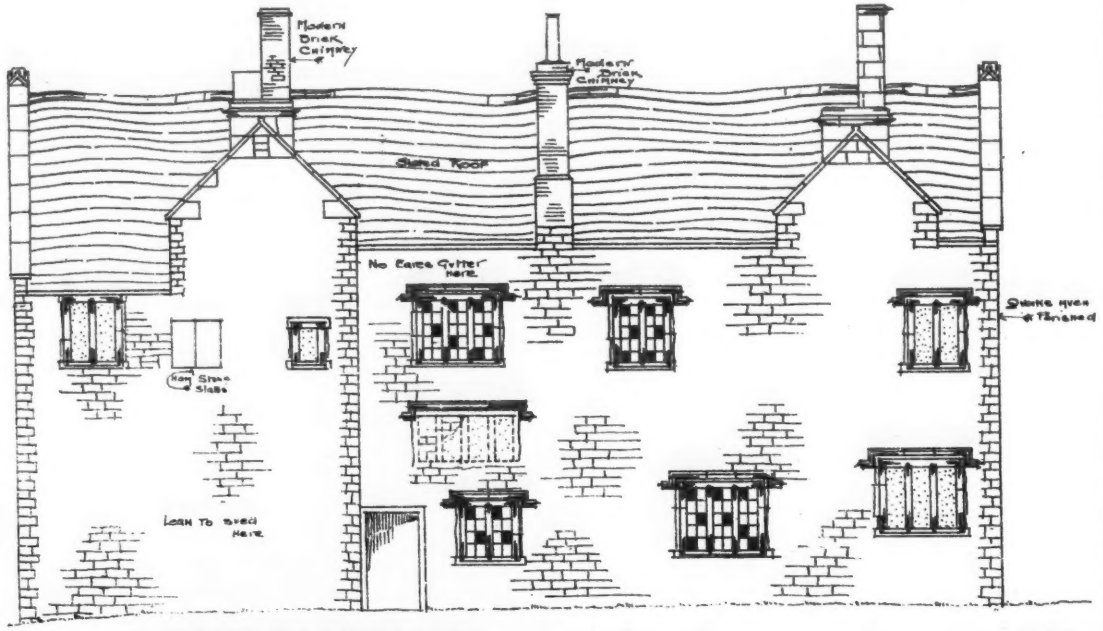
LANGFORD MANOR FIVEHEAD SOMERSET



WEST ELEVATION



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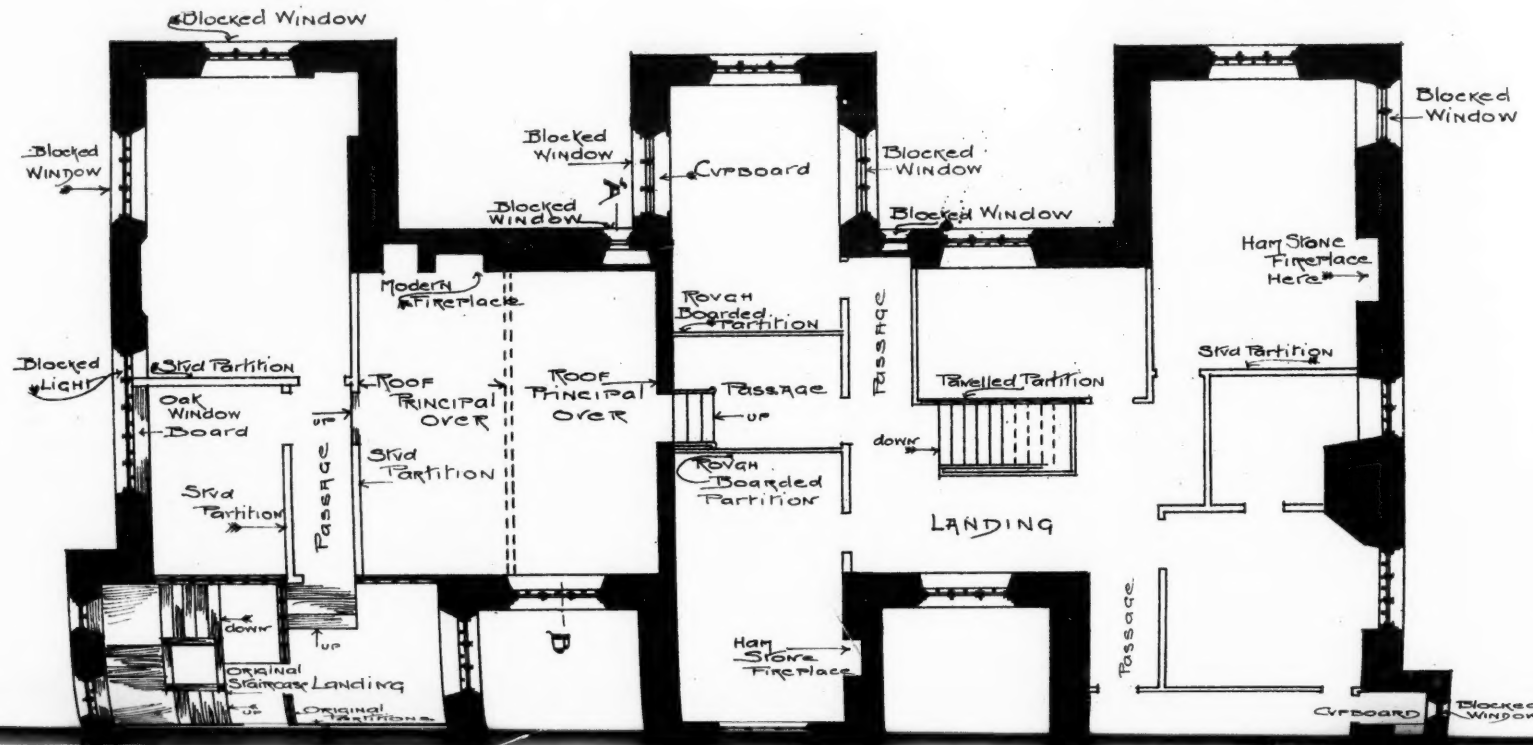
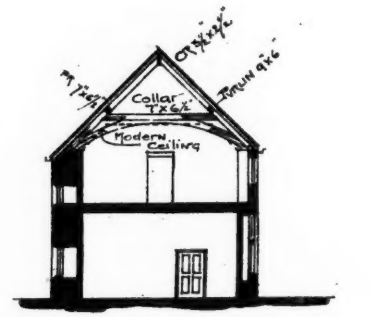
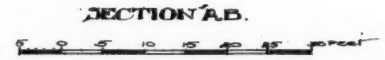


FIRST FLOOR PLAN



SECTION A.B.



Scale for Section

Original Staircase Landing
Original Partition
Ham Stone Fireplace
Rough Boarded Partition
Ham Stone Fireplace
Blocked Window

FIRST FLOOR PLAN

Bins
Cupboard
Blocked Window
Fireplace
Recess
Studs
Blocked Window

SECTION A.B.

Scale for Section

Window Walled Up
Door Under
Modern Staircase
Seat
Modern Lean To Shed (Thatched Roof)
Closed (Window)
Window Walled Up
PORCH
Oak Dado Painted
Wood Floor Here
Window Closed Up
Closed Door
Stud Partition
Modern Fireplace
Jambs of Original Fireplace now Walled Up
Oak Door Here
Shelf
Oak Panelled Partition (Painted)
Oak Dado Painted
Oak + Elm Panelling
Note
Wood Floor Here
DAIRY
Up
Up
Oak + Elm Panelling
Modern Stair Oak Treads
Elm Panelling
Modern Door
Up
Window under Landing
Closed Door
Studding
Stud Partition
Window Seat
Oak Door Here
Stone Seat
PORCH
down
Stud Partition
Baize door
Oak Door Here
No Glazing Here
No Glazing Here
Landing
Landing
Up
Original Staircase
Modern Doorway
Lower Jambs of Original Window Remaining
Modern Door
Elm Panelling
Elm Bressummer 1·6 x 1·0 over
Oven
No Glazing Here
Oak + Elm Panelled Partition
Studding
Original Ham Stone Fireplace Interior
Modern
Oak Window Board
Window Walled Up
Ham Stone Jambs
Studding
Recess
Oven Here
Seat
Oak Window Board
Window Closed Up
Note
There is a Porch of New Masonry here Possibly indicating the Position of an Original Window
TEMPORARY STRUCTURE
Yard

GROUND FLOOR PLAN

Note
Original Work Shewn Thus
Modern Work Shewn Thus

0 5 0 10 20 30 40 FEET

SCALE OF FEET

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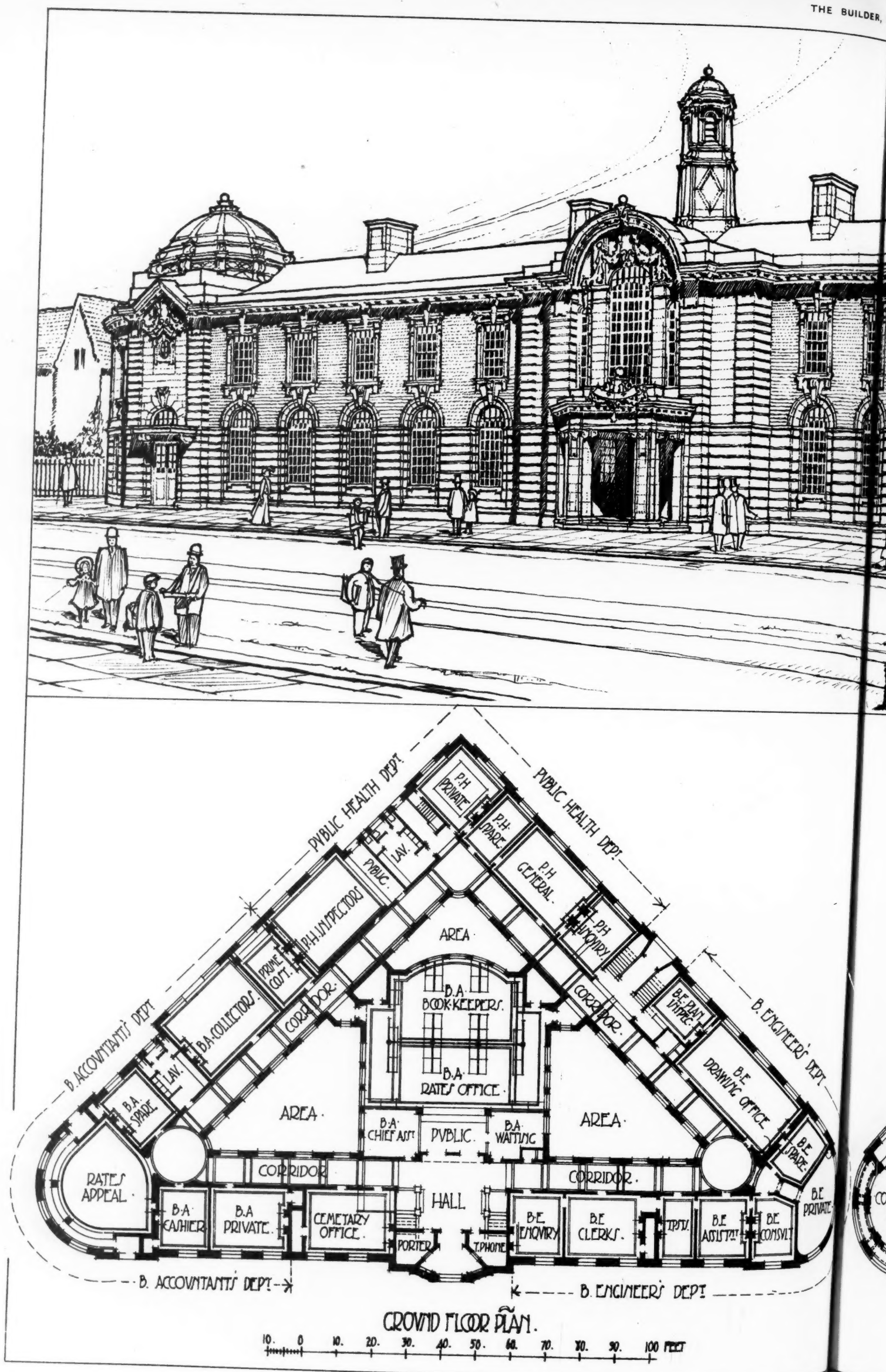
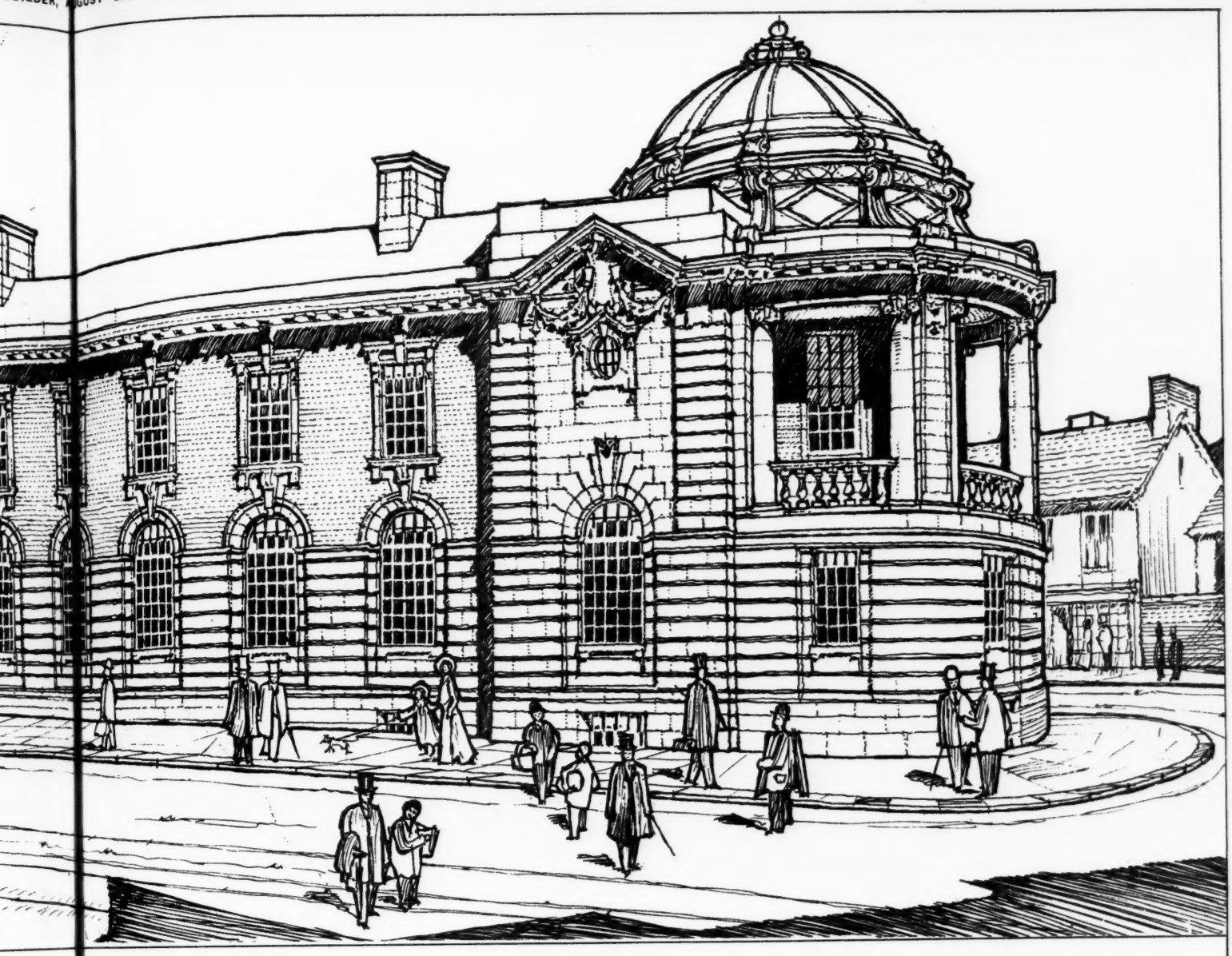
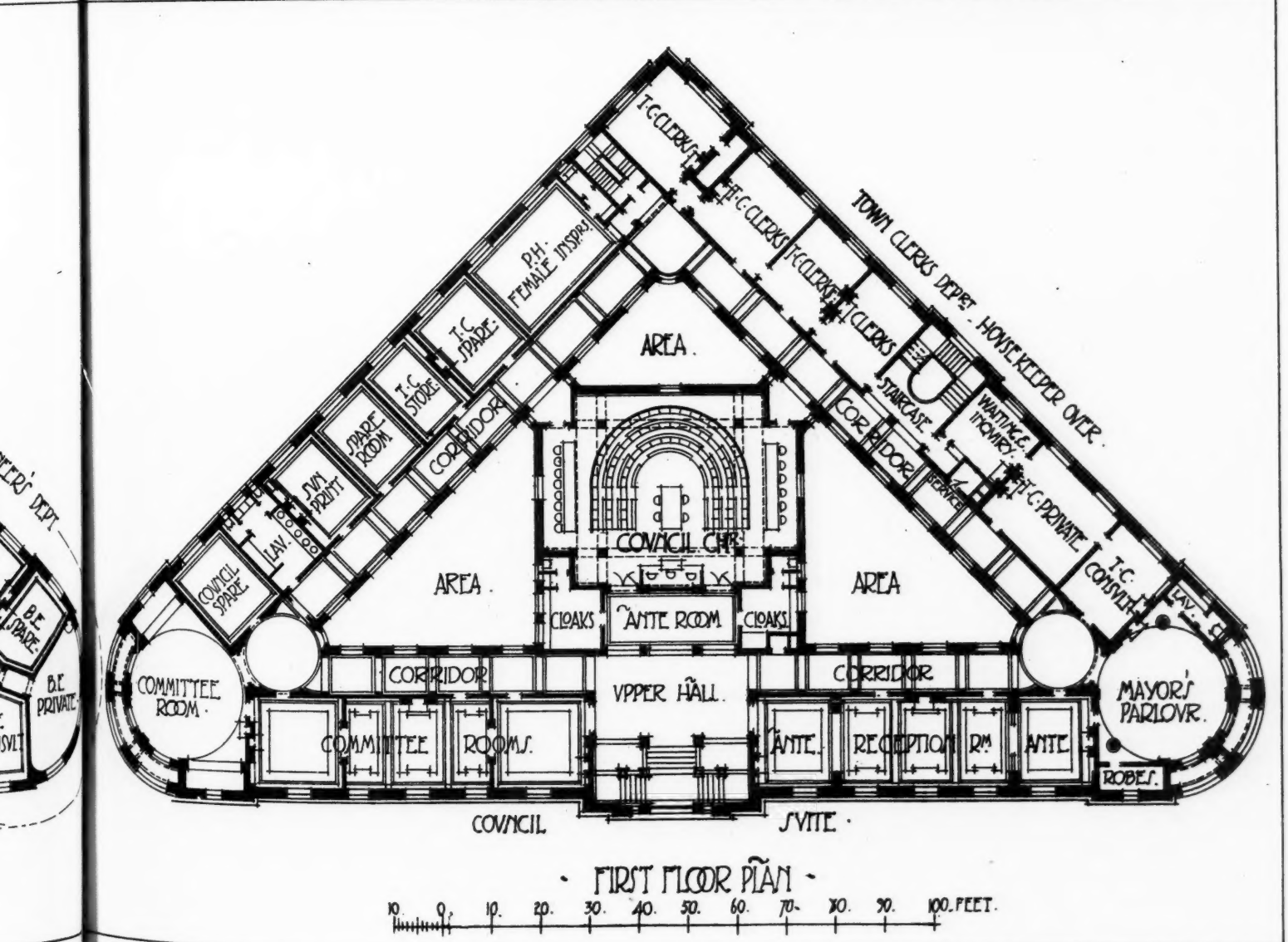


GROUND FLOOR PLAN.

LAMBETH MUNICIPAL BUILDINGS COMPE[illegible]ON.—DESIGN BY





FIRST FLOOR PLAN

10. 0. 10. 20. 30. 40. 50. 60. 70. 80. 90. 100. FEET.

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